3942

THIRD IEMP DATA QUARTERLY SUMMARY FOR 2001

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

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U.S. DEPARTMENT OF ENERGY

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AMS	air monitoring station
BTV	benchmark toxicity value
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
EPLTS	Enhanced Permanent Leachate Transmission System
ESD	Explanation of Significant Differences
FEMP	Fernald Environmental Management Project
FFCA	Federal Facilities Compliance Agreement
FRL	final remediation level
GMA	Great Miami Aquifer
gpad	gallons per acre per day
gpm	gallons per minute
HTW	Horizontal Till Well
IEMP	Integrated Environmental Monitoring Plan
lbs	pounds
LCS	leachate collection system
LDS	leak detection system
M gal	million gallons
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Units
OEPA	Ohio Environmental Protection Agency
pCi/L	picoCuries per liter
pCi/m^3	picoCuries per cubic meter
PSP	Project-Specific Plan
QA/QC	Quality Assurance/Quality Control
SWRB	Storm Water Retention Basin
TLD	thermoluminescent dosimeter
WPRAP	Waste Pits Remedial Action Project
µg/L	micrograms per liter
$µg/m^3$	micrograms per cubic meter

1.0 INTRODUCTION

This Third Integrated Environmental Monitoring Plan (IEMP) Data Quarterly Summary for 2001 has been prepared in a manner consistent with Revision 2 of the IEMP (DOE 2001a), and incorporates subsequent input from the U.S. Environmental Protection Agency (EPA) and the Ohio Environmental Protection Agency (OEPA). All IEMP data are now being provided to the EPA and OEPA on an ongoing basis throughout the quarter via the IEMP Data Information Site (i.e., the "Extranet Site"), at *http://iempdata.fernald.gov*. This document covers all data that became available for posting on the IEMP Data Information Site from July 1 through September 30 (the third quarter) of 2001. Table 1-1 identifies, on a general level, the data covered under this quarterly summary.

The goal of the IEMP quarterly summaries is to minimize textual discussion by focusing on notable events and results related to the data covered, while summarizing data in the form of graphical and tabular presentations. Comprehensive reporting, including all tables and graphs, will still be provided through IEMP annual integrated site environmental reports.

TABLE 1-1

SCHEDULE FOR IEMP DATA INFORMATION SITE AVAILABILITY AND REPORTING

IEMP PROGRAM	TIME PERIOD[a]								
	First Quarter/2001			Second Quarter/2001			Third Quarter/2001		
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
GROUNDWATER SAMPLING ACTIVITIES									
Extraction/Re-injection Operational Data			☒	☒	☒	◆	◆	◆	
South Plume Aquifer Conditions	|----------☒---------|			|----------◆----------|				
South Field Extraction Aquifer Conditions	|----------☒			|----------◆					
Waste Storage Area Aquifer Conditions	|----------☒			|----------◆					
Plant 6 Area Aquifer Conditions	Not Applicable[b]			|----------◆			Not Applicable[b]		
Property Boundary Monitoring	☒----------|			◆----------|				
Private Well Monitoring	☒----------|			◆----------|				
Groundwater Elevations				☒----------|		◆----------|		
OSDF SAMPLING ACTIVITIES									
LCS and LDS Volumes			☒	☒	☒	◆	◆	◆	
Analytical				|----------◆----------|				
SURFACE WATER SAMPLING ACTIVITIES									
NPDES			☒	☒	☒	◆	◆	◆	
FFCA			☒	☒	☒	◆	◆	◆	
IEMP Characterization	☒	☒	☒	◆	◆	◆	◆[c]	◆[c]	
Turbidity Monitoring (for Sloan's Crayfish)				☒	☒	☒	◆	◆	◆
AIR SAMPLING ACTIVITIES									
Radiological Particulate			☒	☒	☒	☒/◆[d]	◆	◆	◆[e]
NESHAP Composite	|----------☒			|----------◆					
NESHAP Stack	|----------☒			|----------◆					
Environmental Radon			☒	☒	☒	◆	◆	◆	
Silos Headspace Real Time Radon			☒	☒	☒	◆	◆	◆	◆
Direct Radiation (TLD)	|----------☒			|----------◆					

◆ Data collected during this time period were available for posting on the IEMP Data Information Site on September 30, 2001, and consequently, are covered in this quarterly summary. Subsequent data were not yet made available on the IEMP Data Information Site by September 30, 2001; and therefore, will be summarized in future quarterly summaries.

☒ Data collected during this time period were covered in the previous IEMP data quarterly summary (July 2001).

[a]IEMP sampling that takes place during one scheduled event per quarter is identified with a marker (e.g., |----------◆----------|) in the mont the samples were collected.
[b]Plant 6 area aquifer conditions sampling is conducted semi-annually.
[c]Preliminary results from July and August at Location SWD-03 are included in Figure 4-1 to support findings
[d]Radiological Particulate data from the first sampling event in June (June 12) were covered in the previous quarterly summary (second quarter 2001).
[e]Radiological particulate data from the first sampling event in September (September 4) are covered in this quarterly summary.

2.0 GROUNDWATER MONITORING DATA

2.1 DATA COVERED

This quarterly summary covers all IEMP groundwater monitoring data that became available for posting to the IEMP Data Information Site from July 1 through September 30, 2001. Specifically, this includes:

- Operational data collected from June 1, 2001 through August 31, 2001
- All analytical data collected during the second quarter of 2001. This includes the South Field, South Plume, Property Boundary, Private Well, Plant 6, and the Waste Storage Area Monitoring Programs
- Groundwater (Great Miami Aquifer) elevations from the third quarter of 2001.

All of the data sets for the aforementioned programs are complete in accordance with sampling requirements identified in the IEMP Revision 2 (DOE 2001a) for the time periods identified.

2.2 NOTABLE RESULTS AND EVENTS

Notable results and events are those that impact, or could potentially impact, the scope of IEMP monitoring or remediation operations at the Fernald site. Notable results and events associated with IEMP groundwater monitoring data for the time period covered by this quarterly summary include:

- Waste Storage Area Phase I Groundwater Restoration Module: Responses to EPA and OEPA comments on the April 2001 design for this module were submitted on June 26 (reference DOE letter # DOE-0677-01). EPA and OEPA approved the responses in letters dated July 8 and September 4, 2001, respectively. Installation and development of the two additional extraction wells for this module was completed in mid August. An additional groundwater recovery well in the South Field was also installed and developed during the third quarter. The new South Field well installation was performed in conjunction with the waste storage area installation to expedite the schedule and to save costs by doing all the work together under the same contracts. Work on completing the piping and infrastructure for all of the new wells continued through the reporting period. Pumping of the new wells is scheduled to begin in early 2002. Installation of groundwater monitoring wells in the waste storage area plume is being planned for the fourth quarter.
- Waste Pit 3 Excavation: A significant portion of the glacial till underlying Pit 3 was exposed during the reporting period. As of the close of the reporting period, approximately 0.37 acres of till was exposed. Accumulated water has the potential to infiltrate through the till and impact the underlying Great Miami Aquifer (GMA). Therefore, any runoff that accumulates in the excavation is pumped from the excavation as soon as feasible. According to observations by the excavation contractor, very little runoff accumulated in the excavation during the summer as the rainfall was, for the most part, absorbed into waste contained in the pit.

The thickness of the till in the exposed area is at least 3.5 feet, which offers a measure of protection to the underlying GMA. This till thickness is based on the surveyed elevation of the exposed till surface and Operable Unit 5 Remedial Investigation data which defined the elevation of the bottom of the till in the pit area. Impacts to the underlying GMA, in the area of Pit 3, will be addressed as necessary by Phase II of the Waste Storage Area Groundwater Restoration Module. Phase II is to be installed after excavation of the waste pits is complete.

- Uranium Explanation of Significant Differences (ESD): As described in the Second IEMP Data Quarterly Summary for 2001 (DOE 2001b), DOE is working with the EPA and OEPA to modify the groundwater final remediation level (FRL) for total uranium from 20 micrograms per liter (µg/L) to 30 µg/L. The modification to the Operable Unit 5 Record of Decision is based on EPA's finalization of the drinking water standard for total uranium of 30 µg/L last December. After addressing EPA and OEPA comments on the Draft ESD document explaining the modification, the "draft final" version of the ESD document was public noticed in July per 40 CFR 300.435 (c)(2)(l), thus initiating the public comment period. The comment period began on July 10, 2001, and lasted until August 31, 2001. A formal public hearing was held on August 23, 2001. As of the end of the reporting period, responses to the public comments were in review. A responsiveness summary is being prepared to address all comments received and will be submitted to the EPA's with the final ESD. It is anticipated that the Final ESD along with responses to public comments will be completed and issued by the end of this year.

- Dioxin Sampling: On June 13, 2001, DOE submitted a letter formally requesting a reduction in the number of monitoring wells scheduled to be sampled for dioxins this year (reference DOE letter # DOE-0642-01). The request was based on the improbability of finding dioxins outside the potential source areas. EPA and OEPA approved the request in letters dated July 26, 2001 and July 19, 2001, respectively.

- Groundwater Re-Injection: The re-injection rate continued to be below the design rate throughout the reporting period (Table 2-4) due to residual plugging of the re-injection wells. However, development of a revised treatment process to alleviate plugging in the re-injection wells was completed during the quarter. After the necessary approvals were obtained, the new process was implemented in late August. Implementation of the new treatment procedure to alleviate well plugging began at Re-injection Well 22111 on August 27. After three rounds of treatment, the well was brought back on line on September 26 at a re-injection rate of 150 gallons per minute (gpm) to maximize its useful life. As of the end of the September, the well was still injecting water with minimal increase in head (since start-up after the treatment), indicating the new treatment process was more successful than the previous attempts. However, it remains to be seen whether the new treatments will keep the plugging in abeyance for a sufficient time such that the new treatment is economically viable for routine use. Treatment of Re-injection Well 22240 was initiated the last week in September. The remaining re-injection wells are scheduled to receive the new treatment during the next couple of months.

- Total Uranium Plume Map: As of the close of the reporting period, all routine IEMP data were available to prepare a second quarter 2001 total uranium plume map; however, the plume map is currently being revised to support the design of the South Field Phase II Aquifer Restoration Module. While the revision will use the data from the IEMP program, it will be enhanced by using additional data collected to support the design. The additional data are from pre-design Geoprobe™ work in the South Field area and from sampling of other South Field area monitoring wells not included in the routine IEMP sampling program. The revised map will be provided with the design submittal and in the next IEMP quarterly summary.

- Five-Year Sampling: The five-year groundwater sampling event for constituents identified as "<N" in the IEMP began in the second quarter. Several samples have results that exceed the FRL for bis(2-ethylhexyl)phthalate, a common laboratory contaminant. These exceedances are suspect and are being investigated. More information will be available and included in the Fourth IEMP Data Quarterly Summary for 2001.

- Extranet Data: Revision 2 of the IEMP includes additional filtering requirements for groundwater samples, as stated in Section 3.6.2.1. In Comment Response #21 of DOE's Responses to EPA and OEPA Comments on the IEMP, Revision 2 (January 2001), it was identified that DOE would work to include the turbidity results on the IEMP Data Information Site. Thus, the IEMP Data Information Site will be updated in October 2001 to include the turbidity results for each groundwater sample. Specifically, the Groundwater Data Query and the On-Site Disposal Facility Water Data Query, as well as the groundwater and on-site disposal facility downloadable files, will be updated to include turbidity data for all samples collected since January 2001. Additionally, the following specific fields within the IEMP Data Information Site will be updated:

  - The "Filter Type" field will replace the "Filter" field. "Filter Type" will identify either UNFILTERED, 0.45 micron, or 5.0 micron.
  - A new field, "Turbidity (NTU)" will be added.

  Note that all groundwater data collected prior to January 1, 2001 will not be updated since the filtering protocol had not been instituted.

A thorough review of the groundwater monitoring data covered by this quarterly summary was conducted to identify the notable results. Supplementary tables are also provided here in support of the findings listed above. Tables 2-1 through 2-4 provide an operational summary of the groundwater extraction well performance for June through August 2001. All data covered by this quarterly summary are available on the IEMP Data Information Site. Maps showing the locations of IEMP groundwater monitoring wells are also provided on the IEMP Data Information Site.

TABLE 2-1

AQUIFER RESTORATION SYSTEM OPERATIONAL SUMMARY SHEET

	Reporting Period					
	June 2001 through August 2001			August 1993 through August 2001		
	Gallons Pumped/Re-Injected (M gal)	Total Uranium Removed/Re-Injected (lbs)	Uranium Removal Index (lbs/M gal)	Gallons Pumped/Re-injected (M gal)	Total Uranium Removed/Re-Injected (lbs)	Uranium Removal Inde (lbs/M gal)
South Field (Phase I) Extraction Module	261.942	153.78	0.59	2,794.316	1,753.74	0.63
South Plume Module	269.883	73.17	0.27	6,090.578	1,246.84	0.20
Re-Injection Module	16.38	0.63	NA[a]	943.756	39.11	NA[a]
Aquifer Restoration Systems Totals						
(Extraction Wells)	531.825	226.95	0.43	8,884.894	3,000.58	0.34
(Re-Injection Wells)	16.38	0.63	NA[a]	943.756	39.11	NA[a]
(net)	515.445	226.32	NA[a]	7,941.138	2,961.47	NA[a]

[a]NA = not applicable

TABLE 2-2

**SOUTH FIELD (PHASE I) EXTRACTION MODULE
OPERATIONAL SUMMARY SHEET
(JUNE 2001 THROUGH AUGUST 2001)**

Extraction Well	31565[a,b]	31564	31566[b]	31563	31567[c]	31550	31560	31561	31562[d]	32276	32447[e]	32446
	Baseline Remedial Strategy Report Target Pumping Rates (gpm)											
	200	200	200	200	100	100	100	100	100	200	NA	NA
	Average Pumping Rates (gpm)											
June	NA	213	NA	216	274	110	110	111	246	324	230	201
July	NA	221	NA	220	278	110	110	112	226	332	154	201
August	NA	221	NA	220	279	110	109	111	56	332	300	200
Average	NA	218	NA	219	277	110	110	111	176	329	228	201
	Average Total Uranium Concentrations (µg/L)											
June	NA	12.2	8.0	21.5	25.5	46.2	60.2	53.7	90.4	125.2	178.2	76.7
July	NA	11.3	4.3	21.6	25.2	43.1	58.7	56.8	78.1	132.6	171.6	73.9
August	NA	11.6	8.5	18.1	23.6	36.0	47.5	49.8	71.6	119.8	159.4	67.4
Average	NA	11.7	6.9	20.4	24.8	41.8	55.5	53.4	80.0	125.9	169.7	72.7
	Uranium Removal Index (Pounds of Total Uranium Removed/Million Gallons Pumped)											
June	NA	0.10	NA	0.18	0.21	0.39	0.50	0.45	0.75	1.04	1.49	0.64
July	NA	0.09	NA	0.18	0.21	0.36	0.49	0.47	0.65	1.11	1.43	0.62
August	NA	0.10	NA	0.15	0.20	0.30	0.40	0.42	0.60	1.00	1.33	0.56
Average	NA	0.10	NA	0.17	0.21	0.35	0.46	0.45	0.67	1.05	1.42	0.61

	Average Module Pumping Rate (gpm)		Water Pumped by Module (M gal)		Total Uranium Concentration from Module[f] (µg/L)	
June	2,035		87.894			74.2
July	1,964		87.740			68.6
August	1,938		86.308			68.4
Average	1,979	Total	261.942		Average	70.4

[a]The well was removed from service on May 22, 2001.
[b]NA = not applicable
[c]Target pumping rate was increased from 100 gpm to 250 gpm on August 8, 2000.
[d]Target pumping rate was increased from 200 gpm to 290 gpm on September 14, 2000.
[e]Target pumping rate was increased from 200 gpm to 300 gpm on April 19, 2001.
[f]Average is calculated from individual well total uranium concentrations and flow rates.

TABLE 2-3

SOUTH PLUME MODULE
OPERATIONAL SUMMARY SHEET
(JUNE 2001 THROUGH AUGUST 2001)

Extraction Well	3924	3925	3926	3927	32308	32309
	Baseline Remedial Strategy Report Target Pumping Rates (gpm)					
	300	300	400	400	250	250
	Average Pumping Rates (gpm)					
June	303	305	357	495	290	286
July	307	299	358	470	301	299
August	306	302	346	486	301	299
Average	305	302	354	484	297	295
	Average Total Uranium Concentrations (µg/L)					
June	36.0	28.2	30.5	2.4	65.9	58.0
July	29.1	27.7	32.6	1.8	64.9	61.9
August	31.9	25.3	30.1	2.7	55.9	56.5
Average	32.3	27.1	31.1	2.3	62.2	58.8
	Uranium Removal Index (Pounds of Total Uranium Removed/Million Gallons Pumped)					
June	0.30	0.24	0.25	0.02	0.55	0.48
July	0.24	0.23	0.27	0.02	0.54	0.52
August	0.27	0.21	0.25	0.02	0.47	0.47
Average	0.27	0.23	0.26	0.02	0.52	0.49

	Average Module Pumping Rate (gpm)		Water Pumped by Module (M gal)		Total Uranium Concentration From Module[a] (µg/L)
June	2,036		88.053		33.0
July	2,034		90.796		33.3
August	2,040		91.034		30.8
Average	2,037	Total	269.883	Average	32.4

[a]Average is calculated from individual well total uranium concentrations and flow rates.

TABLE 2-4

RE-INJECTION MODULE
OPERATIONAL SUMMARY SHEET
(JUNE 2001 THROUGH AUGUST 2001)

Re-Injection Well	22107	22108	22109	22240	22111
	Baseline Remedial Strategy Report Target Re-Injection Rates (gpm)				
	200	200	200	200	200
	Average Re-Injection Rates (gpm)				
June	0	0	29	153	0
July	0	0	0	89	0
August	0	0	0	101	0
Average	0	0	9.7	114	0

	Average Module Re-Injection Rate (gpm)	Water Re-Injected By Module (M gal)	Total Uranium Concentration from Module (µg/L)
June	182	7.896	3.1
July	89	3.910	9.0
August	101	4.574	3.6
Average	124	Total 16.38	Average 5.2

3.0 ON-SITE DISPOSAL FACILITY MONITORING DATA

3.1 DATA COVERED

This IEMP data quarterly summary covers all on-site disposal facility monitoring data collected under the IEMP program that became available for posting to the IEMP Data Information Site from July 1 through September 30, 2001. Specifically, this includes:

- Leachate collection system (LCS) volumes, leak detection system (LDS) volumes, and accumulation rates obtained during June, July and August 2001
- Analytical data collected during the second quarter of 2001.

These data sets are complete for these time periods, in accordance with sampling requirements identified in the On-Site Disposal Facility Groundwater/Leak Detection and Leachate Monitoring Plan (DOE 1997) and subsequent agreements with the EPA and OEPA.

3.2 NOTABLE RESULTS AND EVENTS

Notable results and events are those that impact, or could potentially impact, the scope of IEMP monitoring or remediation operations at the Fernald site. Notable results and events associated with on-site disposal facility monitoring data covered by this quarterly summary include the following:

- LDS Accumulation Rates: The June through August 2001 LDS accumulation rates for Cells 1 and 2 versus Fernald Environmental Management Project (FEMP) precipitation are provided in Figures 3-1 and 3-2 respectively. The LDS for Cell 3 did not yield any water during the reporting period, therefore a figure is not provided. The maximum accumulation rates for Cells 1 and 2 were 2.5 and 10.5 percent, respectively, of the initial response leakage rate of 20 gallons per acre per day.
- New Maximum Concentrations: The second quarter 2001 data indicated new maximum total uranium concentrations in the Cell 2 LCS (12339C), the Cell 3 LCS (12340C) and in the upgradient GMA monitoring well for Cell 3 (Well 22203).
- Cells 1-3 Groundwater Baseline Technical Memorandum: DOE met with EPA and OEPA to discuss the on-site disposal facility groundwater baseline data for Cells 1-3 on Thursday, August 23, 2001. Data reviewed at the meeting included total uranium concentration data from the LCS, LDS, and Horizontal Till Wells (HTWs), as well as total uranium concentration data from the GMA wells - compared to water levels. The meeting consensus was to not establish a GMA baseline at this time due to the probability that the current baseline data set does not adequately represent baseline. As an alternative to establishing GMA baseline, EPA suggested the data be reviewed annually with them. The plan is to put some of the GMA data in the technical memorandum - sufficient to illustrate why it is not appropriate to establish GMA baseline at this time - along with supporting text.

- For the HTWs: Also at the August 23, 2001 meeting with EPA and OEPA, it was highlighted that some of the HTW constituents were showing upward trends, particularly in Cell 3. These trends may complicate the establishment of a baseline. It was agreed that the HTW data evaluation would continue with the goal of establishing a HTW baseline (albeit with caveats, due to the trends in some constituents at some locations).

- Due to the accelerated schedule for construction of Cells 4 and 5, the installation of the remaining three GMA monitoring wells for these two cells is being accelerated as well so the baseline sampling can begin ahead of waste placement. The downgradient well for Cell 4 (Well 22205) was installed in August 1999. The Project-Specific Plan for the installation of the remaining planned on-site disposal facility GMA monitoring wells was submitted to the EPAs on August 14, 2001 (reference DOE Letter # DOE-0805-01). Drilling of the wells is scheduled to begin in early October with sampling scheduled to begin in November of this year.

- Geoprobe™ sampling was initiated at each of the to-be-drilled on-site disposal facility GMA monitoring well locations to provide additional aquifer uranium profile data in the vicinity of the on-site disposal facility footprint. This Geoprobe™ sampling was conducted in conjunction with the Cells 4 and 5 monitoring well installations, and is based on discussions with EPA and OEPA at the August 23, 2001 meeting noted above. At the close of the reporting period, Geoprobe™ sampling at two of the three monitoring well locations had been completed. As discussed in the weekly teleconference with EPA and OEPA, Geoprobe™ sampling at the third location was postponed due to probe rod breakage resulting in the loss of portions of two Geoprobe™ tool strings near that location (downgradient of Cell 5).

A thorough review of the on-site disposal facility monitoring data covered by this quarterly summary was conducted to identify the notable results. Supplementary tables and figures are also provided here in support of the findings listed above. Tables 3-1 through 3-3 provide analytical results from the second quarter of 2001 for Cells 1 through 3, respectively, along with a summary of previous data for those constituents. These tables include all constituents in the on-site disposal facility monitoring program to highlight the number of constituents that have not been detected. These results will be discussed in detail in the 2001 Integrated Site Environmental Report. Based on the large number of non-detects, revisions to the on-site disposal facility monitoring program constituent list may be pursued later this year with the closure and capping of Cell 1. Figures 3-1 and 3-2 show accumulation rates plotted against weekly precipitation for Cells 1 and 2, respectively. All data covered by this quarterly summary are available on the IEMP Data Information Site. A map of the on-site disposal facility sample locations is also provided on the IEMP Data Information Site.

TABLE 3-1

ON-SITE DISPOSAL FACILITY CELL 1 DATA SUMMARY FOR SECOND QUARTER 2001

Note: Non-italicized pertains to total number of samples (including second quarter samples); ***Italicized*** pertains to second quarter samples only.
Shading indicates at least one detection for that constituent at that location.

Constituent (FRL)[a]	LCS[b,c,d,e,f] (12338C)		LDS[b,c,d,e] (12338D)		HTW[b,c,d,e] (12338)		Great Miami Aquifer: Upgradient[b,c,d] (22201)		Great Miami Aquifer: Downgradient[b,c,d] (22198)	
	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range
Total Organic Carbon (NA[g] mg/L)	12/14 ***1/1***	ND to 123 ***22.6***	11/13 ***1/1***	ND to 80.9 ***6.66***	31/34 ***1/1***	ND to 12.2 ***1.87***	26/29 ***1/1***	ND to 59.7 ***4***	24/29 ***1/1***	ND to 52.5 ***2.04***
Total Organic Halogens (NA[g] mg/L)	12/14 ***1/1***	ND to 0.352 ***0.128***	10/13 ***1/1***	ND to 0.361 ***0.0318***	19/33 ***1/1***	ND to 0.077 ***0.00686***	14/29 ***0/1***	ND to 0.308 ***ND***	8/29 ***0/1***	ND to 0.184 ***ND***
Boron (0.33 mg/L)	15/15 ***1/1***	0.0642 to 2.8 ***1.59***	12/13 ***1/1***	ND to 0.321 ***0.217***	27/34 ***1/1***	ND to 0.685 ***0.074***	24/29 ***1/1***	ND to 0.142 ***0.12***	31/44 ***0/2***	ND to 0.116 ***ND to ND***
Mercury (0.0020 mg/L)	2/14 ***0/1***	ND to 0.00047 ***ND***	0/13 ***0/1***	ND to ND ***ND***	0/34 ***0/1***	ND to ND ***ND***	0/29 ***0/1***	ND to ND ***ND***	0/43 ***0/2***	ND to ND ***ND to ND***
Technetium-99 (94 pCi/L)	4/14 ***0/1***	ND to 18.28 ***ND***	1/13 ***0/1***	ND to 8.92 ***ND***	7/34 ***0/1***	ND to 28.77 ***ND***	1/29 ***0/1***	ND to 13.41 ***ND***	2/45 ***0/2***	ND to 14.8 ***ND to ND***
Total Uranium (20 µg/L)	13/14 ***1/1***	ND to 142.186 ***87.239***	13/13 ***1/1***	1.5 to 20.17 ***9.647***	32/34 ***0/1***	ND to 19 ***ND***	24/29 ***0/1***	ND to 6.384 ***ND***	46/46 ***2/2***	0.557 to 8.365 ***3.004 to 4.009***
Alpha-chlordane (2.0 µg/L)	0/14 ***0/1***	ND to ND ***ND***	0/13 ***0/1***	ND to ND ***ND***	0/34 ***0/1***	ND to ND ***ND***	0/29 ***0/1***	ND to ND ***ND***	0/29 ***0/1***	ND to ND ***ND***
Bis(2-chloroiso propyl)ether (5.0 µg/L)	0/14 ***0/1***	ND to ND ***ND***	0/13 ***0/1***	ND to ND ***ND***	0/34 ***0/1***	ND to ND ***ND***	0/29 ***0/1***	ND to ND ***ND***	0/29 ***0/1***	ND to ND ***ND***
Bromodichlor-methane (100 µg/L)	0/15 ***0/1***	ND to ND ***ND***	1/13 ***0/1***	ND to 10 ***ND***	5/34 ***0/1***	ND to 10 ***ND***	0/29 ***0/1***	ND to ND ***ND***	0/29 ***0/1***	ND to ND ***ND***
Carbazole (11 µg/L)	0/14 ***0/1***	ND to ND ***ND***	0/13 ***0/1***	ND to ND ***ND***	0/34 ***0/1***	ND to ND ***ND***	0/29 ***0/1***	ND to ND ***ND***	0/29 ***0/1***	ND to ND ***ND***
1,1-Dichloro-ethene (7.0 µg/L)	0/15 ***0/1***	ND to ND ***ND***	0/13 ***0/1***	ND to ND ***ND***	0/34 ***0/1***	ND to ND ***ND***	0/29 ***0/1***	ND to ND ***ND***	0/29 ***0/1***	ND to ND ***ND***
1,2-Dichloro-ethene (total) (NA[g] µg/L)	0/13 ***0/1***	ND to ND ***ND***	0/13 ***0/1***	ND to ND ***ND***	0/34 ***0/1***	ND to ND ***ND***	0/29 ***0/1***	ND to ND ***ND***	0/29 ***0/1***	ND to ND ***ND***
4-Nitroaniline (NA[g] µg/L)	0/14 ***0/1***	ND to ND ***ND***	0/13 ***0/1***	ND to ND ***ND***	0/34 ***0/1***	ND to ND ***ND***	0/29 ***0/1***	ND to ND ***ND***	0/29 ***0/1***	ND to ND ***ND***
Tetrachloro-ethene (NA[g] µg/L)	0/15 ***0/1***	ND to ND ***ND***	0/13 ***0/1***	ND to ND ***ND***	0/34 ***0/1***	ND to ND ***ND***	1/29 ***0/1***	ND to 10 ***ND***	0/29 ***0/1***	ND to ND ***ND***
Trichloro-ethene (5.0 µg/L)	0/15 ***0/1***	ND to ND ***ND***	0/13 ***0/1***	ND to ND ***ND***	0/34 ***0/1***	ND to ND ***ND***	0/29 ***0/1***	ND to ND ***ND***	0/44 ***0/2***	ND to ND ***ND to ND***
Vinyl Chloride (2.0 µg/L)	0/15 ***0/1***	ND to ND ***ND***	0/13 ***0/1***	ND to ND ***ND***	0/34 ***0/1***	ND to ND ***ND***	0/29 ***0/1***	ND to ND ***ND***	0/29 ***0/1***	ND to ND ***ND***

[a]From Operable Unit 5 Record of Decision, Table 9-4
[b]If there was more than one sample result per day (e.g., a duplicate sample), then only the maximum sample concentration was counted and compared to the FRL.
[c]Rejected data qualified with either a R or Z were not used in this comparison.
[d]ND = not detected
[e]LCS = leachate collection system; LDS = leak detection system; HTW = horizontal till well
[f]The LCS is also sampled for nitrate/nitrite and total dissolved solids.
[g]NA = not applicable

TABLE 3-2

ON-SITE DISPOSAL FACILITY CELL 2 DATA SUMMARY FOR SECOND QUARTER 2001

Note: Non-italicized pertains to total number of samples (including second quarter samples); ***Italicized*** pertains to second quarter samples only.
Shading indicates at least one detection for that constituent at that location.

Constituent (FRL)[a]	LCS[b,c,d,e,f] (12339C)		LDS[b,c,d,e,g] (12339D)		HTW[b,c,d,e] (12339)		Great Miami Aquifer: Upgradient[b,c,d] (22200)		Great Miami Aquifer: Downgradient[b,c,d] (22199)	
	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range
Total Organic Carbon (NA[h] mg/L)	7/11	ND to 6.25	10/11	ND to 26.1	27/32	ND to 11.1	22/24	ND to 47.6	19/24	ND to 51.8
	0/1	*ND*	*1/1*	*3.36*	*1/1*	*2.27*	*1/1*	*2.38*	*1/1*	*2.39*
Total Organic Halogens (NA[h] mg/L)	4/11	ND to 0.0576	5/11	ND to 0.138	21/32	ND to 0.101	11/24	ND to 0.177	10/24	ND to 0.15
	0/1	*ND*	*1/1*	*0.00486*	*1/1*	*0.0238*	*0/1*	*ND*	*0/1*	*ND*
Boron (0.33 mg/L)	11/12	ND to 0.915	11/11	0.289 to 2.22	20/32	ND to 0.0829	16/24	ND to 0.158	17/24	ND to 0.10
	1/1	*0.296*	*1/1*	*0.4*	*1/1*	*0.0485*	*1/1*	*0.0601*	*1/1*	*0.0476*
Mercury (0.0020 mg/L)	0/11	ND to ND	0/11	ND to ND	2/31	ND to 0.00037	0/23	ND to ND	0/23	ND to ND
	0/1	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*
Technetium-99 (94 pCi/L)	1/11	ND to 21.25	1/11	ND to 15.99	5/33	ND to 12	0/24	ND to ND	0/24	ND to ND
	0/1	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*
Total Uranium (20 µg/L)	11/11	4.51 to 45.122	11/11	9.334 to 71	32/33	ND to 3.607	15/24	ND to 1.11	24/24	0.259 to 12
	1/1	*45.122*	*1/1*	*13.475*	*1/1*	*2.77*	*0/1*	*ND*	*1/1*	*0.875*
Alpha-chlordane (2.0 µg/L)	0/11	ND to ND	0/11	ND to ND	0/32	ND to ND	0/24	ND to ND	0/24	ND to ND
	0/1	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*
Bis(2-chloroiso propyl)ether (5.0 µg/L)	0/11	ND to ND	0/11	ND to ND	0/32	ND to ND	0/24	ND to ND	0/24	ND to ND
	0/1	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*
Bromodichloro-methane (100 µg/L)	0/12	ND to ND	0/11	ND to ND	1/32	ND to 10	0/24	ND to ND	0/24	ND to ND
	0/1	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*
Carbazole (11 µg/L)	0/11	ND to ND	0/11	ND to ND	0/32	ND to ND	0/24	ND to ND	0/24	ND to ND
	0/1	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*
1,1-Dichloro-ethene (7.0 µg/L)	0/12	ND to ND	0/11	ND to ND	0/32	ND to ND	0/24	ND to ND	0/24	ND to ND
	0/1	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*
1,2-Dichloro-ethene (total) (NA[h] µg/L)	0/10	ND to ND	0/11	ND to ND	0/32	ND to ND	0/24	ND to ND	0/24	ND to ND
	0/1	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*
4-Nitroaniline (NA[h] µg/L)	0/11	ND to ND	0/11	ND to ND	0/32	ND to ND	0/24	ND to ND	0/24	ND to ND
	0/1	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*
Tetrachloro-ethene (NA[h] µg/L)	0/12	ND to ND	0/11	ND to ND	0/32	ND to ND	0/24	ND to ND	0/24	ND to ND
	0/1	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*
Trichloro-ethene (5.0 µg/L)	0/12	ND to ND	0/11	ND to ND	0/32	ND to ND	0/24	ND to ND	0/24	ND to ND
	0/1	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*
Vinyl Chloride (2.0 µg/L)	0/12	ND to ND	0/11	ND to ND	0/32	ND to ND	0/24	ND to ND	0/24	ND to ND
	0/1	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*

[a]From Operable Unit 5 Record of Decision, Table 9-4
[b]If there was more than one sample result per day (e.g., a duplicate sample), then only the maximum sample concentration was counted and compared to the FRL.
[c]Rejected data qualified with either a R or Z were not used in this comparison.
[d]ND = not detected
[e]LCS = leachate collection system; LDS = leak detection system; HTW = horizontal till well
[f]The LCS is also sampled for nitrate/nitrite and total dissolved solids.
[g]Cell 2 LDS data from December 1998 to present are suspect due to a December 1998/January 1999 back-up of leachate from the leachate transmission system line into the Cell 2 LDS layer and the resultant residual contamination of the LDS layer from the back-up.
[h]NA = not applicable

TABLE 3-3

ON-SITE DISPOSAL FACILITY CELL 3 DATA SUMMARY FOR SECOND QUARTER 2001

Note: Non-italicized pertains to total number of samples (including second quarter samples); ***Italicized*** pertains to second quarter samples only. Shading indicates at least one detection for that constituent at that location.

Constituent (FRL)[a]	LCS[b,c,d,e,f] (12340C)		HTW[b,c,d,e] (12340)		Great Miami Aquifer: Upgradient[b,c,d] (22203)		Great Miami Aquifer: Downgradient[b,c,d] (22204)	
	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range
Total Organic Carbon (NA[g] mg/L)	5/8	ND to 34.2	18/27	ND to 9.81	11/22	ND to 14.1	11/22	ND to 8.83
	0/1	*ND*	*1/1*	*2.57*	*1/1*	*2.9*	*1/1*	*2.63*
Total Organic Halogens (NA[g] mg/L)	3/8	ND to 0.178	21/27	ND to 0.158	10/22	ND to 0.213	9/23	ND to 0.165
	0/1	*ND*	*1/1*	*0.0033*	*0/1*	*ND*	*1/1*	*0.00304*
Boron (0.33 mg/L)	8/8	0.202 to 1.51	22/26	ND to 0.24	14/22	ND to 0.0933	15/22	ND to 0.179
	1/1	*0.94*	*1/1*	*0.143*	*1/1*	*0.0421*	*1/1*	*0.0417*
Mercury (0.0020 mg/L)	0/8	ND to ND	1/26	ND to 0.00026	0/21	ND to ND	2/21	ND to 0.00028
	0/1	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*
Technetium-99 (94 pCi/L)	0/8	ND to ND	2/26	ND to 38.35	1/22	ND to 22.92	0/22	ND to ND
	0/1	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*
Total Uranium (20 µg/L)	8/8	9.27 to 58.582	24/26	ND to 9.14	17/22	ND to 4.75	19/22	ND to 5.924
	1/1	*58.582*	*1/1*	*7.175*	*1/1*	*4.75*	*0/1*	*ND*
Alpha-chlordane (2.0 µg/L)	0/8	ND to ND	0/27	ND to ND	0/22	ND to ND	0/22	ND to ND
	0/1	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*
Bis(2-chloroiso propyl)ether (5.0 µg/L)	0/8	ND to ND	0/27	ND to ND	0/22	ND to ND	0/22	ND to ND
	0/1	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*
Bromodichloro-methane (100 µg/L)	0/8	ND to ND	0/26	ND to ND	0/22	ND to ND	0/22	ND to ND
	0/1	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*
Carbazole (11 µg/L)	0/8	ND to ND	0/27	ND to ND	0/22	ND to ND	0/22	ND to ND
	0/1	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*
1,1-Dichloro-ethene (7.0 µg/L)	0/8	ND to ND	0/26	ND to ND	0/22	ND to ND	0/22	ND to ND
	0/1	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*
1,2-Dichloro-ethene (total) (NA[g] µg/L)	0/7	ND to ND	0/26	ND to ND	0/22	ND to ND	0/22	ND to ND
	0/1	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*
4-Nitroaniline (NA[g] µg/L)	0/8	ND to ND	0/27	ND to ND	0/22	ND to ND	0/22	ND to ND
	0/1	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*
Tetrachloro-ethene (NA[g] µg/L)	0/8	ND to ND	0/26	ND to ND	0/22	ND to ND	0/22	ND to ND
	0/1	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*
Trichloro-ethene (5.0 µg/L)	0/8	ND to ND	0/26	ND to ND	0/22	ND to ND	0/22	ND to ND
	0/1	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*
Vinyl Chloride (2.0 µg/L)	0/8	ND to ND	0/26	ND to ND	0/22	ND to ND	0/22	ND to ND
	0/1	*ND*	*0/1*	*ND*	*0/1*	*ND*	*0/1*	*ND*

[a]From Operable Unit 5 Record of Decision, Table 9-4
[b]If there was more than one sample result per day (e.g., a duplicate sample), then only the maximum sample concentration was counted and compared to the FRL.
[c]Rejected data qualified with either a R or Z were not used in this comparison.
[d]ND = not detected
[e]HTW = horizontal till well; LCS = leachate collection system
[f]The LCS is also sampled for nitrate/nitrite and total dissolved solids.
[g]NA = not applicable

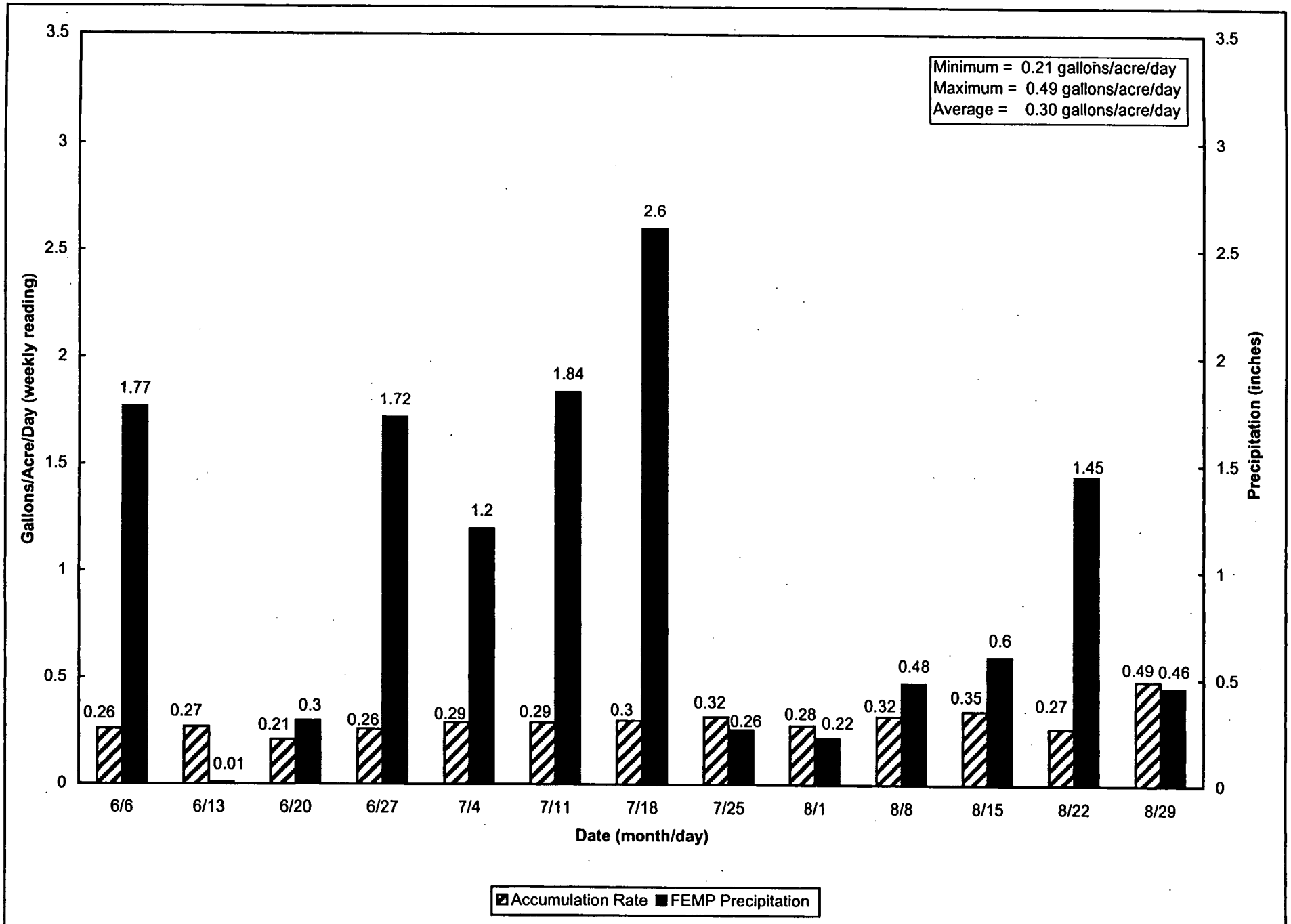


FIGURE 3-1. 2001 ON-SITE DISPOSAL FACILITY LDS ACCUMULATION RATES FOR CELL 1

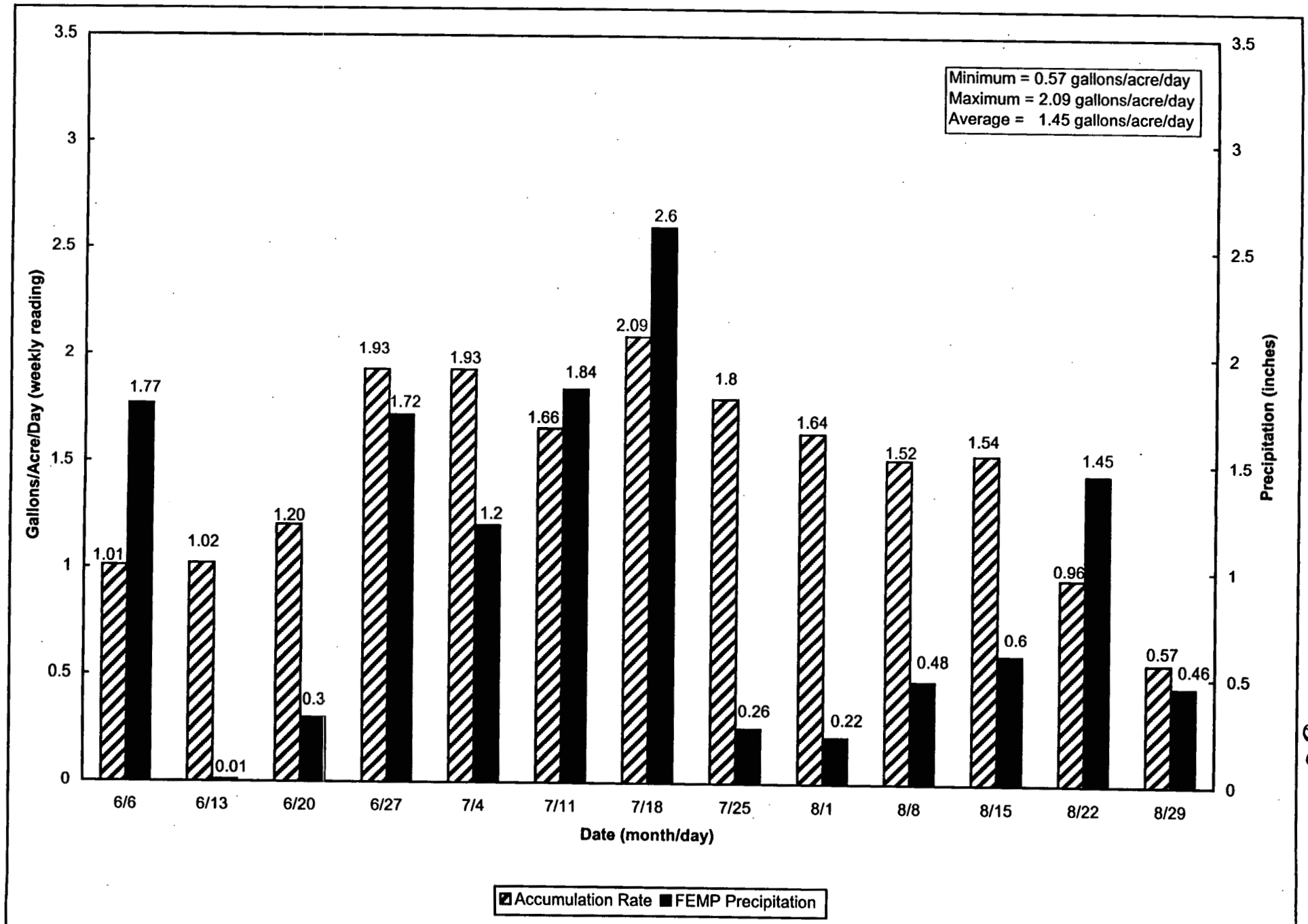


FIGURE 3-2. 2001 ON-SITE DISPOSAL FACILITY LDS ACCUMULATION RATES FOR CELL 2

4. 0 SURFACE WATER MONITORING DATA

4.1 DATA COVERED

This IEMP data quarterly summary covers all surface water monitoring data collected under the IEMP program that became available for posting to the IEMP Data Information Site from July 1 through September 30, 2001. Specifically, this includes:

- National Pollutant Discharge Elimination System (NPDES) data collected during June, July and August 2001.
- Federal Facilities Compliance Agreement (FFCA) data collected during June, July and August 2001.
- IEMP characterization monitoring data collected during the second quarter of 2001. Some preliminary third quarter results from location SWD-03 are also included in Figure 4-1 to support findings discussed in the text.
- Turbidity monitoring in Paddys Run (as related to the Sloan's crayfish population) information obtained during the third quarter of 2001.

All of these data sets are complete in accordance with sampling requirements identified in the IEMP, Revision 2, for the time periods identified.

4.2 NOTABLE RESULTS AND EVENTS

Notable results and events are those that impact, or could potentially impact, the scope of IEMP monitoring or remediation operations at the Fernald site. Notable results and events associated with the surface water monitoring program data identified above are as follows:

- NPDES Permit noncompliances: The following table lists the NPDES noncompliances that occurred and were reported to OEPA, as required, during the period under evaluation.

Date	Location	Parameter	Limit	Result
June 18, 2001	PF 4001	Oil & Grease	105 kg/d	135.7 kg/d
June 22, 2001	PF 4001	Oil & Grease	105 kg/d	193.2 kg/d

- FFCA/Record of Decision compliance: The Operable Unit 5 Record of Decision limit of 20 µg/L at the Parshall Flume (PF 4001) was met in every month during the reporting period.
- IEMP FRL/benchmark toxicity value (BTV) exceedances: There were two surface water FRL exceedances and no BTV exceedances during the evaluation period. On April 20, 2001, two exceedances were experienced at location SWD-03. The copper result of 0.0337 milligrams

per liter (mg/L) exceeded the FRL of 0.012 mg/L and the zinc result of 0.144 mg/L exceeded the FRL of 0.110 mg/L.

- OEPA representatives conducted the annual NPDES compliance inspection on June 13, 2001. Based on the exit interview, no deficiencies were noted in the NPDES Permit program. As a part of this inspection, OEPA collected samples of FEMP effluent as well as upstream and downstream samples from the Great Miami River for an evaluation of acute toxicity. OEPA found that the FEMP effluent did not exhibit acute toxicity.

- In past quarterly summaries, DOE has reported elevated total uranium concentrations at locations SWD-03 and STRM 4005. As demonstrated on Figure 4-1, it appears the total uranium data generated subsequently indicate that concentrations are lower than what they were before the bio-surge lagoon line leak was repaired on February 2, 2001. Figure 4-1 includes preliminary third quarter (July and August) data for location SWD-03 to further support this finding.

- Nine observations were made for turbidity impacts from the northern drainage ditch on Paddys Run (as related to the Sloan's crayfish population) during the third quarter of 2001. No incidences of increased downstream turbidity were observed in Paddys Run during this period.

- As discussed in Section 2.0, DOE has prepared, submitted, and received public comments on an ESD to the Operable Unit 5 Record of Decision supporting revising the groundwater FRL for total uranium to reflect the finalized EPA drinking water standard for total uranium of 30 μg/L. The surface water uranium discharge limit to the Great Miami River established in the Operable Unit 5 Record of Decision is also being proposed for revision at this time to reflect the 30 μg/L standard.

A thorough review of the surface water monitoring data covered in this quarterly summary was conducted to identify the notable results. Supplementary figures are also provided here in support of the findings listed above. Figure 4-2 shows pounds of uranium discharged to the Great Miami River from the Parshall Flume to-date in 2001. Figure 4-3 shows the 2001 monthly average total uranium concentrations in water discharged from the Parshall Flume. All data covered by this quarterly summary are available on the IEMP Data Information Site. Maps of NPDES and surface water sample locations are also provided on the IEMP Data Information Site.

Note: The surface water FRL for total uranium is 530 µg/L.

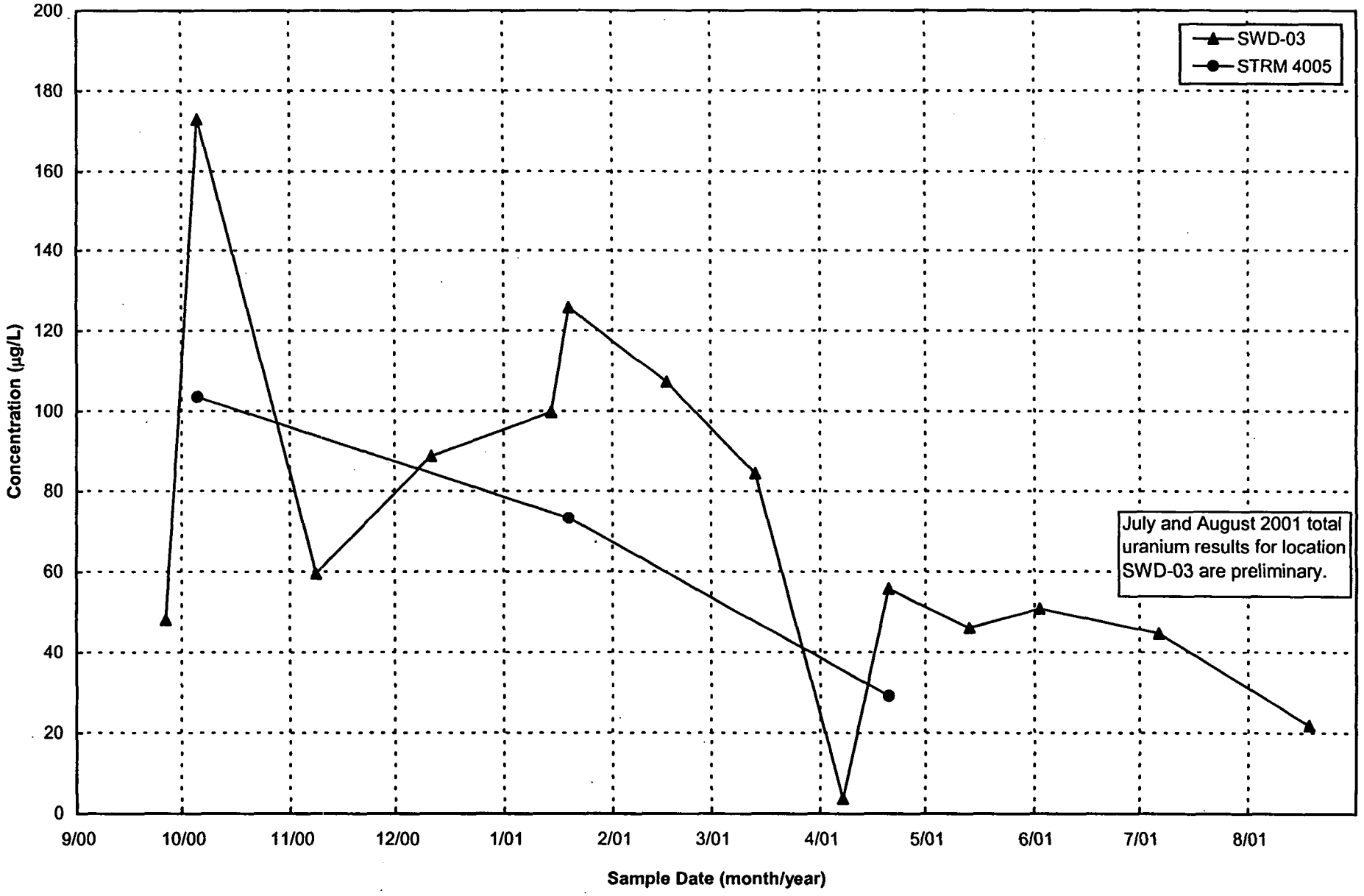
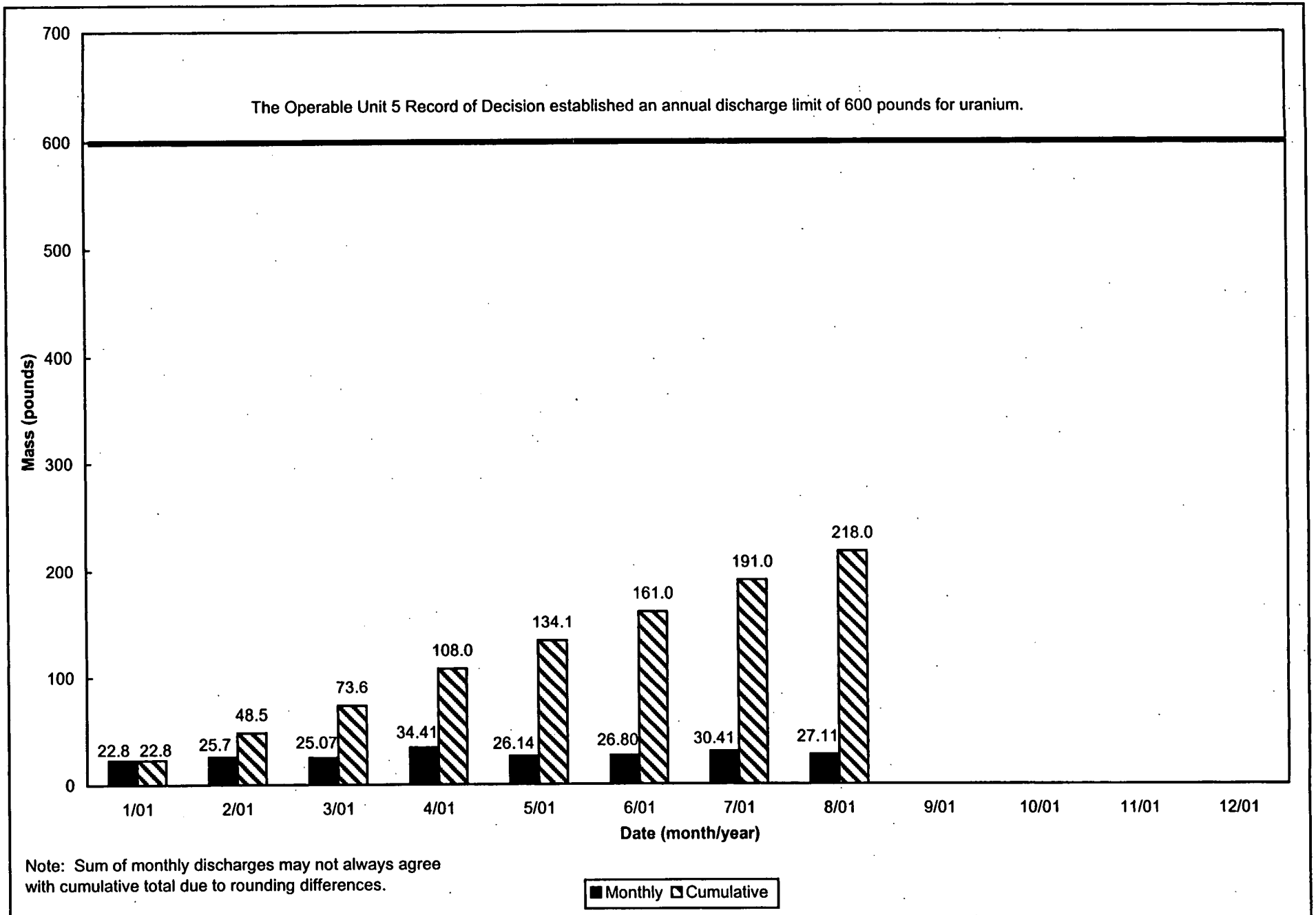


FIGURE 4-1. TOTAL URANIUM CONCENTRATION VS. TIME PLOT FOR LOCATIONS SWD-03 (WASTE STORAGE AREA) AND STRM 4005 (DRAINAGE TO PADDYS RUN)



Note: Sum of monthly discharges may not always agree with cumulative total due to rounding differences.

FIGURE 4-2. POUNDS OF URANIUM DISCHARGED TO THE GREAT MIAMI RIVER FROM THE PARSHALL FLUME (PF 4001) IN 2001

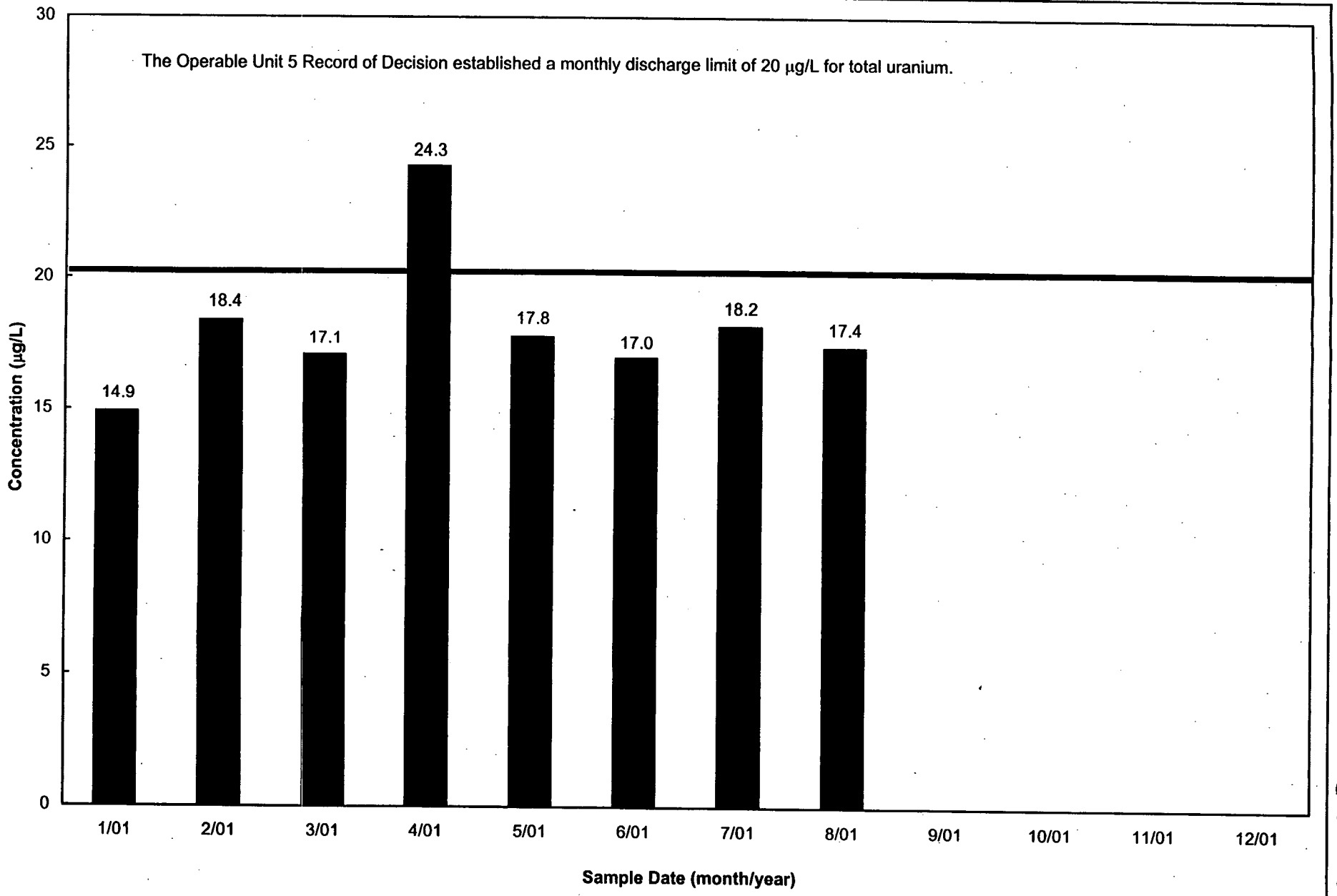


FIGURE 4-3. 2001 MONTHLY AVERAGE TOTAL URANIUM CONCENTRATION IN WATER DISCHARGED FROM THE PARSHALL FLUME (PF 4001) TO THE GREAT MIAMI RIVER

5. 0 AIR MONITORING DATA

5.1 DATA COVERED

This IEMP data quarterly summary covers all air monitoring data collected under the IEMP program that became available for posting to the IEMP Data Information Site from July 1, 2001 through September 30, 2001. Specifically, this includes:

- Radiological air particulate monitoring results from biweekly samples covering the period of June 12 through September 4, 2001 (i.e., biweekly samples collected June 26 through September 4). The biweekly sample results for the second quarter 2001, the most recent full calendar quarter of data available, are compiled in table form (Tables 5-3 through 5-7) for the purpose of comparison to previous calendar quarters.
- Radiological air particulate monitoring quarterly composite samples collected during the second quarter of 2001 for National Emissions Standards for Hazardous Air Pollutants (NESHAP) compliance purposes.
- NESHAP stack emissions monitoring samples collected during the second quarter of 2001.
- Environmental radon monitoring data collected from June 1 through August 31, 2001.
- Silos headspace radon concentrations data collected from June 1 through September 30, 2001.
- Direct radiation (thermoluminescent dosimeter [TLD]) monitoring data collected during the second quarter of 2001.

All of the data sets for the aforementioned programs are complete in accordance with sampling requirements identified in the IEMP, Revision 2 for the time periods identified.

5.2 NOTABLE RESULTS AND EVENTS

Notable results and events are those that impact, or could potentially impact, the scope of IEMP monitoring or remediation operations at the Fernald site. Notable results and events associated with IEMP air monitoring data for the time period covered by this quarterly summary include the following:

- Figures 5-1 through 5-6 illustrate that uranium and thorium-230 concentrations have been generally stable at the site fenceline during the period from June 12 to September 4, 2001. It is likely that the comparatively low concentrations measured during this period reflect the Waste Pits Remedial Action Project (WPRAP) implementation of practices improving the control of fugitive emissions and limiting the thorium-230 concentration of waste material fed into the dryers. These practices, in combination with changes in the properties of waste processed at WPRAP, contributed to a general decrease in uranium and thorium concentrations at the fenceline relative to concentrations measured during the first quarter of 2001.

- The maximum second quarter 2001 dose at the site fenceline air monitoring stations was 0.18 millirem (mrem) as summarized in Table 5-1. The maximum year-to-date dose through the second quarter at the site fenceline air monitoring stations (AMS-3) is 0.37 mrem as summarized in Table 5-2. On average, thorium isotopes contributed approximately 54 percent of the year-to-date dose measured at all air monitors. In particular, thorium-230 contributed 43 percent of the dose, while uranium and radium-226 contributed an average of approximately 26 percent and 19 percent, respectively. The second quarter radium-226 results from three air monitoring stations (AMS-5, AMS-24, and AMS-29) were unusually high. The results are being reviewed and evaluated.

- As noted in previous IEMP quarterly summaries, direct radiation (TLD) measurements have shown a positive upward trend in the immediate area of the K-65 Silos (locations 22 through 26 [refer to Figure 5-7]) and, to a lesser extent, at the site fenceline nearest the K-65 Silos (location 6 [refer to Figure 5-8]). During the second quarter of 2001, decreases in the silo headspace concentration of radon lead to a slight decrease in the direct radiation measurements in the vicinity of the K-65 Silos.

- During the third quarter 2001, silo headspace radon concentrations (refer to Figure 5-9) began to increase, yet remain below levels measured during the third and fourth quarters of 2000. Periodic changes in silo headspace concentrations have occurred in the past and are apparently related to seasonal weather patterns. The changes in headspace concentrations do not appear to be related to silo leakage rates since the average radon levels at the exclusion fence monitors (KNE, KSE, etc.) have been generally stable since the fourth quarter of 2000 (refer to Figure 5-10).

- During the period of June through September 2001, there were no exceedances of the DOE Order 5400.5 100 picoCuries per liter (pCi/L) radon limit. For comparison, there were five exceedances of the 100 pCi/L radon limit during that same time period in 2000.

A thorough review of the air monitoring data covered by this quarterly summary was conducted to identify the notable results. Supplementary tables and figures are also provided here in support of the findings listed above. Table 5-1 contains the second quarter doses for each air monitoring station and the fractional contribution of each radionuclide to the total dose. Table 5-2 contains the year-to-date doses for each air monitoring station and the fractional contribution of each radionuclide to the total dose. Tables 5-3 through 5-7 summarize the total uranium, total particulate and isotopic thorium concentrations at selected fenceline locations (AMS-3, AMS-8A and AMS-9C) during the second quarter of 2001 for the biweekly sampling program. Table 5-8 summarizes the current (June through August) and 2001 year-to-date environmental radon data from continuous monitors. All data covered by this quarterly summary are available on the IEMP Data Information Site, as well as maps showing the locations of air monitoring stations.

TABLE 5-1

SECOND QUARTER 2001 NESHAP COMPLIANCE TRACKING

	40 CFR 61 (NESHAP) Subpart H Appendix E, Table 2; Net Ratios[a]													
Location	Ac-228[b]	Ra-224[b]	Ra-226	Ra-228[b]	Th-228	Th-230	Th-231[b]	Th-232	Th-234[b]	U-234	U-235/ U-236	U-238	Ratio Totals	Dose[c] (mrem)
Fenceline														
AMS-2	3.6E-07	8.8E-06	1.4E-03	2.2E-04	4.6E-04	2.6E-03	1.6E-09	2.1E-03	3.7E-06	9.7E-04	6.2E-05	9.8E-04	0.009	0.089
AMS-3	1.7E-07	4.3E-06	--	1.1E-04	2.8E-04	3.4E-03	5.1E-09	1.0E-03	1.0E-05	2.2E-03	2.0E-04	2.7E-03	0.010	0.100
AMS-4	--	--	--	--	--	8.2E-03	--	--	1.4E-06	2.5E-04	--	3.8E-04	0.001	0.014
AMS-5	--	--	1.5E-02[d]	--	1.5E-04	2.0E-03	--	--	1.2E-06	3.1E-04	--	3.3E-04	0.018	0.182
AMS-6	1.6E-07	3.9E-06	--	1.0E-05	3.3E-04	3.1E-03	--	9.5E-05	2.8E-06	5.8E-04	--	7.4E-04	0.005	0.049
AMS-7	2.3E-07	5.6E-06	--	1.4E-04	1.0E-04	2.3E-03	--	1.4E-03	2.0E-06	4.8E-04	--	5.2E-04	0.005	0.049
AMS-8A	4.7E-07	1.2E-05	--	2.9E-04	6.2E-04	4.5E-03	4.0E-09	2.8E-03	7.1E-06	1.8E-03	1.6E-04	1.9E-03	0.012	0.120
AMS-9C	2.9E-07	7.1E-06	2.1E-03	1.8E-04	4.7E-04	3.9E-03	3.5E-09	1.7E-03	9.1E-06	2.0E-03	1.4E-04	2.4E-03	0.013	0.130
AMS-22	9.4E-07	2.3E-06	2.1E-03	5.9E-05	2.7E-04	4.7E-03	2.2E-09	5.6E-04	4.6E-06	7.4E-04	8.7E-05	1.2E-03	0.010	0.097
AMS-23	1.5E-07	3.7E-06	2.3E-04	9.3E-05	1.2E-05	2.4E-03	2.2E-09	8.9E-04	3.7E-06	7.1E-04	8.7E-05	9.9E-04	0.005	0.055
AMS-24	5.0E-08	1.2E-06	1.4E-02[d]	3.1E-05	--	4.7E-03	--	3.0E-04	1.1E-06	1.9E-04	--	2.8E-04	0.015	0.154
AMS-25	--	--	--	--	--	3.1E-03	--	--	6.2E-07	7.6E-05	--	1.6E-04	0.001	0.006
AMS-26	7.2E-08	1.8E-06	1.8E-04	4.5E-05	7.9E-05	1.6E-03	1.9E-09	4.3E-04	3.1E-06	6.5E-04	7.5E-05	8.2E-04	0.004	0.038
AMS-27	2.3E-07	5.6E-06	5.2E-04	1.4E-04	3.8E-04	2.8E-03	1.8E-09	1.4E-03	3.1E-06	6.8E-04	6.9E-05	8.3E-04	0.007	0.068
AMS-28	4.7E-09	1.1E-05	2.1E-03	2.9E-04	5.2E-04	6.9E-03	2.4E-09	2.8E-03	6.9E-06	1.1E-03	9.6E-05	1.8E-03	0.016	0.156
AMS-29	1.3E-07	3.2E-06	4.7E-03[d]	8.1E-05	5.5E-04	2.8E-03	2.1E-09	7.7E-04	4.4E-06	9.3E-04	8.3E-04	1.2E-03	0.011	0.111
Background														
AMS-12	4.9E-07	1.2E-05	1.1E-02	3.1E-04	7.4E-04	9.0E-04	--	2.9E-03	9.4E-07	3.8E-04	--	2.5E-04	NA[e]	
AMS-16	6.0E-07	1.5E-05	9.5E-03	3.8E-04	8.3E-04	7.9E-04	--	3.6E-03	1.5E-06	3.4E-04	--	4.1E-04	NA[e]	
QA/QC														
Column Check[f]	0.000	0.001	0.428	0.017	0.043	0.445	0.000	0.163	0.001	0.137	0.011	0.173	NA[e]	1.42

Maximum Quarterly Ratio: 0.0182
Maximum Quarterly Dose (mrem): 0.182

[a]A "--" indicates the filter results were less than or equal to the blank results, and/or the indicator concentrations were less than or equal to the average net background concentrations.
[b]Isotopes assumed to be in equilibrium with their parents.
[c]Dose conversions are based on the NESHAP standard of 10 mrem per year.
[d]Pending evaluation/reanalysis.
[e]NA = not applicable
[f]Column check is the sum of doses from each radionuclide, followed by the sum of doses (1.42) at all fenceline monitors.

TABLE 5-2

2001 YEAR-TO-DATE NESHAP COMPLIANCE TRACKING

	40 CFR 61 (NESHAP) Subpart H Appendix E, Table 2; Net Ratios[a]													
Location	Ac-228[b]	Ra-224[b]	Ra-226	Ra-228[b]	Th-228	Th-230	Th-231[b]	Th-232	Th-234[b]	U-234	U-235/ U-236	U-238	Ratio Totals	Dose[c] (mrem
Fenceline														
AMS-2	4.6E-07	1.1E-05	3.7E-03	2.9E-04	6.4E-04	5.6E-03	4.9E-09	2.8E-03	1.1E-05	2.7E-03	1.9E-04	2.9E-03	0.019	0.19
AMS-3	5.3E-07	1.3E-05	6.4E-03	3.3E-04	6.4E-04	1.2E-02	1.4E-08	3.2E-03	2.8E-05	6.4E-03	5.5E-04	7.4E-03	0.037	0.373
AMS-4	--	--	--	--	--	1.4E-03	8.6E-10	--	2.8E-06	5.8E-04	3.4E-04	7.4E-04	0.003	0.027
AMS-5	--	--	1.8E-02[d]	--	1.5E-04	3.8E-03	--	--	2.7E-06	5.8E-04	--	7.3E-04	0.024	0.237
AMS-6	1.4E-07	3.4E-06	1.6E-04	8.7E-05	4.4E-04	1.1E-02	--	8.3E-04	6.5E-06	1.5E-03	--	1.7E-03	0.016	0.161
AMS-7	2.3E-07	5.6E-06	--	1.4E-04	1.0E-04	4.3E-03	7.9E-10	1.4E-03	3.0E-06	6.8E-04	3.1E-05	7.9E-04	0.007	0.074
AMS-8A	8.5E-07	2.1E-05	2.9E-03	5.3E-04	9.7E-04	1.1E-02	1.1E-08	5.1E-03	2.3E-05	5.5E-03	4.3E-04	6.1E-03	0.032	0.321
AMS-9C	5.9E-07	1.4E-05	2.1E-03	3.7E-04	6.4E-04	1.1E-02	1.3E-08	3.5E-03	2.8E-05	6.7E-03	5.0E-04	7.4E-03	0.033	0.328
AMS-22	4.6E-07	1.1E-05	2.5E-03	2.9E-04	3.8E-04	1.1E-02	6.7E-09	2.7E-03	1.2E-05	2.5E-03	2.6E-04	3.2E-03	0.023	0.232
AMS-23	1.9E-07	4.8E-06	1.7E-03	1.2E-04	1.4E-04	5.6E-03	4.5E-09	1.2E-03	8.2E-06	1.7E-03	1.8E-04	2.2E-03	0.013	0.129
AMS-24	5.0E-07	1.2E-06	1.4E-02[d]	3.1E-05	1.5E-04	2.2E-03	6.3E-10	3.0E-04	1.8E-06	3.9E-03	2.5E-05	4.8E-04	0.018	0.175
AMS-25	8.1E-07	2.0E-06	--	5.1E-05	--	3.5E-03	1.6E-09	4.8E-04	1.4E-06	3.2E-03	6.4E-05	3.6E-04	0.005	0.048
AMS-26	1.0E-07	2.5E-06	1.9E-03	6.4E-05	7.9E-05	5.3E-03	3.7E-09	6.1E-04	7.6E-06	1.7E-03	1.5E-04	2.0E-03	0.012	0.118
AMS-27	3.3E-07	8.1E-06	1.5E-03	2.1E-04	3.8E-04	3.8E-03	3.0E-09	2.0E-03	4.0E-06	7.6E-04	1.2E-04	1.1E-03	0.010	0.098
AMS-28	5.4E-07	1.3E-05	2.1E-03	3.4E-04	5.2E-04	1.1E-02	4.2E-09	3.2E-03	1.0E-05	1.8E-03	1.6E-04	2.7E-03	0.022	0.217
AMS-29	2.5E-07	6.2E-06	4.7E-03[d]	1.6E-04	5.5E-04	9.3E-03	5.5E-09	1.5E-03	1.1E-05	2.4E-03	2.2E-04	2.8E-03	0.022	0.215
Background														
AMS-12	6.1E-07	1.5E-05	2.3E-02	3.8E-04	7.4E-04	1.4E-03	--	3.7E-03	1.7E-06	5.7E-04	--	4.5E-04	NA[e]	
AMS-16	9.5E-07	2.3E-05	2.6E-02	5.9E-03	1.3E-03	1.3E-03	--	5.7E-03	2.6E-06	6.8E-04	--	6.9E-04	NA[e]	
QA/QC														
Column Check[f]	0.000	0.001	0.621	0.030	0.057	1.128	0.000	0.286	0.002	0.362	0.029	0.425	NA[e]	2.94

Maximum Year-To-Date Ratio: 0.0373
Maximum Year-To-Date Dose (mrem): 0.373

[a]A "--" indicates the filter results were less than or equal to the blank results, and/or the indicator concentrations were less than or equal to the average net backgro concentrations.
[b]Isotopes assumed to be in equilibrium with their parents.
[c]Dose conversions are based on the NESHAP standard of 10 mrem per year.
[d]Results pending evaluation and reanalysis.
[e]NA = not applicable
[f]Column check is the sum of doses from each radionuclide, followed by the sum of doses (2.94) at all fenceline monitors.

TABLE 5-3

TOTAL URANIUM PARTICULATE CONCENTRATIONS IN AIR

	Second Quarter 2001 Results[a] (April - June) (pCi/m^3 x 1E-6)				2001 Annual Summary Results[a] (pCi/m^3 x 1E-6)				1990 through 2000 Summary Results[a] (pCi/m^3 x 1E-6)	
	No. of Samples	Min.	Max.	Avg.	No. of Samples	Min.	Max.	Avg.	Min.	Max.
Fenceline										
AMS-2	6	37	144	104	13	19	235	115	0	3500
AMS-3	6	80	391	205	13	80	908	278	0	17000
AMS-4	6	0.0	80	38	13	0.0	105	46	0	2300
AMS-5	6	27	68	45	13	13	139	55	0	4400
AMS-6	6	37	103	80	13	13	257	90	0	3200
AMS-7	6	18	102	55	13	0.0	102	54	0	7800
AMS-8A	6	64	208	141	13	64	928	259	0	1135
AMS-9C[b]	6	63	325	186	13	63	989	279	0	784
AMS-22	6	0.0	208	91	13	0.0	743	127	0	238
AMS-23	6	24	110	72	13	24	191	89	0	202
AMS-24	6	18	60	38	13	7.6	87	40	0	207
AMS-25	6	18	88	47	13	4.9	88	40	0	402
AMS-26	6	19	117	74	13	19	340	88	0	267
AMS-27	6	37	108	71	13	2.7	117	55	0	170
AMS-28	6	60	239	133	13	23	239	103	0	445
AMS-29	6	27	162	92	13	7.6	314	104	0	326
Background										
AMS-12	6	0.0	32	16	13	0.0	53	15	0	480
AMS-16	6	0.0	48	17	13	0.0	56	19	0	350

[a]For blank corrected concentrations less than or equal to 0.0 pCi/m^3, the concentration is set as 0.0 pCi/m^3.
[b]Summary results for 1990 through 2000 include AMS-9B/C data.

TABLE 5-4

TOTAL PARTICULATE CONCENTRATIONS IN AIR

	Second Quarter 2001 Results (April - June) (µg/m³)				2001 Annual Summary Results (µg/m³)				1990 through 2000 Summary Results (µg/m³)	
	No. of Samples	Min.	Max.	Avg.	No. of Samples	Min.	Max.	Avg.	Min.	Max.
Fenceline										
AMS-2	6	26	61	41	13	24	61	34	7.0	77
AMS-3	6	25	53	36	13	21	53	30	8.0	159
AMS-4	6	27	52	40	13	24	52	34	13	79
AMS-5	6	26	48	38	13	21	48	30	9.6	62
AMS-6	6	31	53	38	13	23	53	33	8.0	69
AMS-7	6	27	55	40	13	3	55	32	6.8	84
AMS-8A	6	30	57	41	13	23	57	34	13	89
AMS-9C[a]	6	29	62	40	13	24	62	33	7.1	136
AMS-22	6	29	54	40	13	19	54	34	13	57
AMS-23	6	24	71	39	13	22	71	32	11	57
AMS-24	6	26	51	37	13	15	51	31	5.4	79
AMS-25	6	27	54	38	13	26	54	34	17	69
AMS-26	6	23	46	31	13	21	46	28	15	52
AMS-27	6	44	82	56	13	27	82	48	16	92
AMS-28	6	24	69	40	13	5.8	69	30	12	68
AMS-29	6	29	51	38	13	22	51	33	11	62
Background										
AMS-12[b]	6	26	49	35	26	20	49	29	6.0	416
AMS-16[b]	6	33	62	46	26	29	62	41	18	84
Project-Specific										
WPTH-2	6	34	53	41	26	28	53	37	25	46

[a]Summary results for 1990 through 2000 include AMS-9B/C data.
[b]Total particulate analysis was discontinued during 1994 and was reinstated for AMS-12 and AMS-16 in 1997.

TABLE 5-5

THORIUM-228 PARTICULATE CONCENTRATIONS IN AIR

	Second Quarter 2001 Results[a] (April - June) (pCi/m^3 x 1E-6)				2001 Annual Summary Results[a] (pCi/m^3 x 1E-6)				1990 through 2000 Summary Results[a] (pCi/m^3 x 1E-6)	
	No. of Samples	Min.	Max.	Avg.	No. of Samples	Min.	Max.	Avg.	Min.	Max.
Fenceline										
AMS-2	6	2.9	19	8.9	13	0.0	19	6.1	0.8	10
AMS-3	6	3.2	24	11	13	2.2	24	9.5	1.1	10
AMS-4	6	0.0	18	10	13	0.0	18	6.2	0.0	8.6
AMS-5	6	3.8	12	7.8	13	0.0	14	5.4	0.0	6.1
AMS-6	6	0.0	16	10	13	0.0	16	6.3	0.0	8.1
AMS-7	6	2.3	17	9.3	13	0.0	17	5.4	4.4	11
AMS-8A	6	5.0	24	12	13	0.0	29	9.3	1.2	13
AMS-9C[b]	6	0.0	21	13	13	0.0	28	11	3.0	13
AMS-22	6	0.0	18	8.1	13	0.0	27	6.7	1.4	8.6
AMS-23	6	0.0	22	8.4	13	0.0	22	5.9	0.0	7.6
AMS-24	6	0.0	14	7.0	13	0.0	14	4.3	0.38	7.5
AMS-25	6	3.4	13	8.1	13	0.0	13	5.7	0.0	6.7
AMS-26	6	0.0	24	8.2	13	0.0	24	5.8	2.6	14
AMS-27	6	3.9	19	12	13	0.0	21	8.0	0.37	7.4
AMS-28	6	0.0	39	15	13	0.0	39	8.9	0.0	14
AMS-29	6	0.0	18	10	13	0.0	20	7.3	0.0	7.1
Background										
AMS-12	6	0.0	11	6.1	6	0.0	6.7	4.1	0.0	6.7
AMS-16	6	0.0	16	9.5	6	0.0	17	7.3	0.0	17
Background										
WPTH-2	6	0.8	28	12	26	0.0	13	7.3	0.0	17

[a]For blank corrected concentrations less than or equal to 0.0 pCi/m^3, the concentration is set as 0.0 pCi/m^3.
[b]Summary results for 1990 through 2000 include AMS-9B/C data.

TABLE 5-6

THORIUM-230 PARTICULATE CONCENTRATIONS IN AIR

	Second Quarter 2001 Results[a] (April - June) (pCi/m^3 x 1E-6)				2001 Annual Summary Results[a] (pCi/m^3 x 1E-6)				1990 through 200 Summary Results (pCi/m^3 x 1E-6)	
	No. of Samples	Min.	Max.	Avg.	No. of Samples	Min.	Max.	Avg.	Min.	Max.
Fenceline										
AMS-2	6	0.0	56	28	13	0.0	104	34	3.1	27
AMS-3	6	12	125	54	13	7.9	391	100	3.4	63
AMS-4	6	12	53	25	13	1.0	81	23	0.0	23
AMS-5	6	0.0	92	26	13	0.0	620	68	0.0	43
AMS-6	6	6.7	83	45	13	6.3	226	49	0.0	74
AMS-7	6	4.2	74	37	13	0.0	74	22	0.0	44
AMS-8A	6	19	133	58	13	5.1	461	93	6.3	71
AMS-9C[b]	6	23	125	61	13	4.8	407	94	12	78
AMS-22	6	5.9	233	67	13	5.9	493	84	12	46
AMS-23	6	12	73	37	13	7.8	153	42	1.5	19
AMS-24	6	9.4	42	22	13	0.0	125	23	3.4	24
AMS-25	6	4.2	25	13	13	0.0	223	28	0.37	23
AMS-26	6	2.4	42	24	13	0.0	233	37	2.6	37
AMS-27	6	16	125	47	13	0.0	126	35	0.0	99
AMS-28	6	27	401	111	13	10	401	77	0.0	357
AMS-29	6	0.0	119	36	13	0.0	537	70	6.1	45
Background										
AMS-12	6	0.8	42	17	13	0.0	42	10	0.0	9.3
AMS-16	6	3.0	15	9.4	13	0.0	18	8.3	0.0	18
Project Specific										
WPTH-2	6	31	110	60	26	25	110	57	0.73	557

[a]For blank corrected concentrations less than or equal to 0.0 pCi/m^3, the concentration is set as 0.0 pCi/m^3.
[b]Summary results for 1990 through 2000 include AMS-9B/C data.

TABLE 5-7

THORIUM-232 PARTICULATE CONCENTRATIONS IN AIR

	Second Quarter 2001 Results[a] (April - June) (pCi/m³ x 1E-6)				2001 Annual Summary Results[a] (pCi/m³ x 1E-6)				1990 through 2000 Summary Results[a] (pCi/m³ x 1E-6)	
	No. of Samples	Min.	Max.	Avg.	No. of Samples	Min.	Max.	Avg.	Min.	Max.
Fenceline										
AMS-2	6	0.0	19	10	13	0.0	19	8.0	0.0	8.6
AMS-3	6	5.5	23	14	13	0.0	23	10	0.0	9.8
AMS-4	6	0.0	22	11	13	0.0	22	6.7	0.0	9.3
AMS-5	6	2.4	14	7.0	13	0.0	15	6.1	0.0	9.1
AMS-6	6	0.4	22	12	13	0.0	22	6.6	0.0	8.1
AMS-7	6	0.4	16	8.7	13	0.0	16	5.7	0.38	12
AMS-8A	6	8.5	20	13	13	1.1	24	10	0.0	8.4
AMS-9C[b]	6	6.7	22	15	13	2.7	34	13	1.8	11
AMS-22	6	0.8	32	10	13	0.0	35	8.4	0.0	6.5
AMS-23	6	3.6	75	21	13	0.0	75	12	0.0	5.2
AMS-24	6	0.0	11	7.3	13	0.0	11	4.2	0.0	9.1
AMS-25	6	0.0	8.4	5.1	13	0.0	10	4.1	1.1	10
AMS-26	6	0.0	12	6.1	13	0.0	12	5.4	0.38	14
AMS-27	6	6.8	22	13	13	0.0	22	7.9	0.0	7.8
AMS-28	6	3.1	33	15	13	0.0	33	8.1	0.0	17
AMS-29	6	1.2	19	9.1	13	0.0	19	6.4	0.0	13
Background										
AMS-12	6	3.2	8.4	6.4	13	0.0	8.4	3.8	0.0	9.3
AMS-16	6	3.4	18	11	13	0.0	18	7.0	0.0	14
Project Specific										
WPTH-2	6	0.3	22	12	13	0.3	22	8.0	0.0	17

[a]For blank corrected concentrations less than or equal to 0.0 pCi/m³, the concentration is set as 0.0 pCi/m³.
[b]Summary results for 1990 through 2000 include AMS-9B/C data.

TABLE 5-8

**CONTINUOUS ENVIRONMENTAL RADON MONITORING
MONTHLY AVERAGE CONCENTRATIONS[a]**

	June 2001 through August 2001 Summary Results (Instrument Background Corrected)[b] (pCi/L)			2001 Year-to-Date Summary Results (Instrument Background Corrected)[b] (pCi/L)		
Location	Min.	Max.	Avg.	Min.	Max.	Avg.
Fenceline						
AMS-02	0.2	0.4	0.3	0.1	0.4	0.2
AMS-03	0.3	0.4	0.3	0.1	0.4	0.2
AMS-04	0.2	0.3	0.2	0.1	0.3	0.2
AMS-05	0.4	0.7	0.5	0.1	0.7	0.3
AMS-06	0.2	0.5	0.4	0.1	0.5	0.2
AMS-07	0.3	0.6	0.5	0.2	0.6	0.4
AMS-08A	0.4	0.7	0.6	0.1	0.7	0.3
AMS-09C	0.3	0.8	0.5	0.1	0.8	0.3
AMS-22	0.2	0.3	0.2	0.1	0.3	0.2
AMS-23	0.1	0.3	0.2	0.1	0.3	0.1
AMS-24	0.3	0.5	0.4	0.1	0.5	0.3
AMS-25	0.2	0.5	0.3	0.1	0.5	0.3
AMS-26	0.3	0.4	0.3	0.2	0.4	0.3
AMS-27	0.3	0.5	0.4	0.1	0.5	0.3
AMS-28	0.3	0.6	0.4	0.1	0.6	0.3
AMS-29	0.2	0.3	0.3	0.1	0.3	0.2
Background						
AMS-12	0.3	0.5	0.4	0.2	0.4	0.3
AMS-16	0.0	0.1	0.0	0.1	0.2	0.1
On Site						
KNE	3.0	3.5	3.3	1.1	3.1	2.7
KNO[c]	1.7	2.0	1.8	0.3	2.6	1.2
KNW/KNW-A	0.4	0.6	0.5	0.4	1.3	0.7
KSE	1.1	2.3	1.8	0.9	2.6	1.9
KSO[c]	0.3	0.5	0.4	0.3	0.5	0.4
KSW/KSW-A	0.5	0.7	0.6	0.2	1.0	0.6
KTOP	5.4	9.0	7.7	3.5	6.1	5.7
LP2[d]	0.4	0.7	0.6	0.3	0.5	0.4
Pilot Plant Warehouse	0.3	0.5	0.4	0.3	0.5	0.4
PR-1[e]	0.7	0.9	0.8	0.4	0.7	0.7
Rally Point 4	0.2	0.4	0.3	0.2	0.6	0.3
Surge Lagoon	0.3	0.5	0.4	0.2	0.5	0.4
T117[d]	0.2	0.6	0.3	0.2	0.3	0.3
T28/T28A	0.5	0.7	0.6	0.4	0.7	0.5
TS4	0.4	0.8	0.6	0.2	0.3	0.4
WP-17A	0.3	0.4	0.4	0.2	0.4	0.3

[a]Monthly average radon concentrations are calculated from daily average concentrations. Daily average concentrations are calculated by summing all hourly count data, treating the sum as a single daily measurement, and then converting the sum to a (daily average) concentration.
[b]Instrument background changes as monitors are replaced.
[c]Unit was placed in service in April 2000.
[d]Unit was placed in service in November 2000.
[e]Unit was placed in service in March 2000.

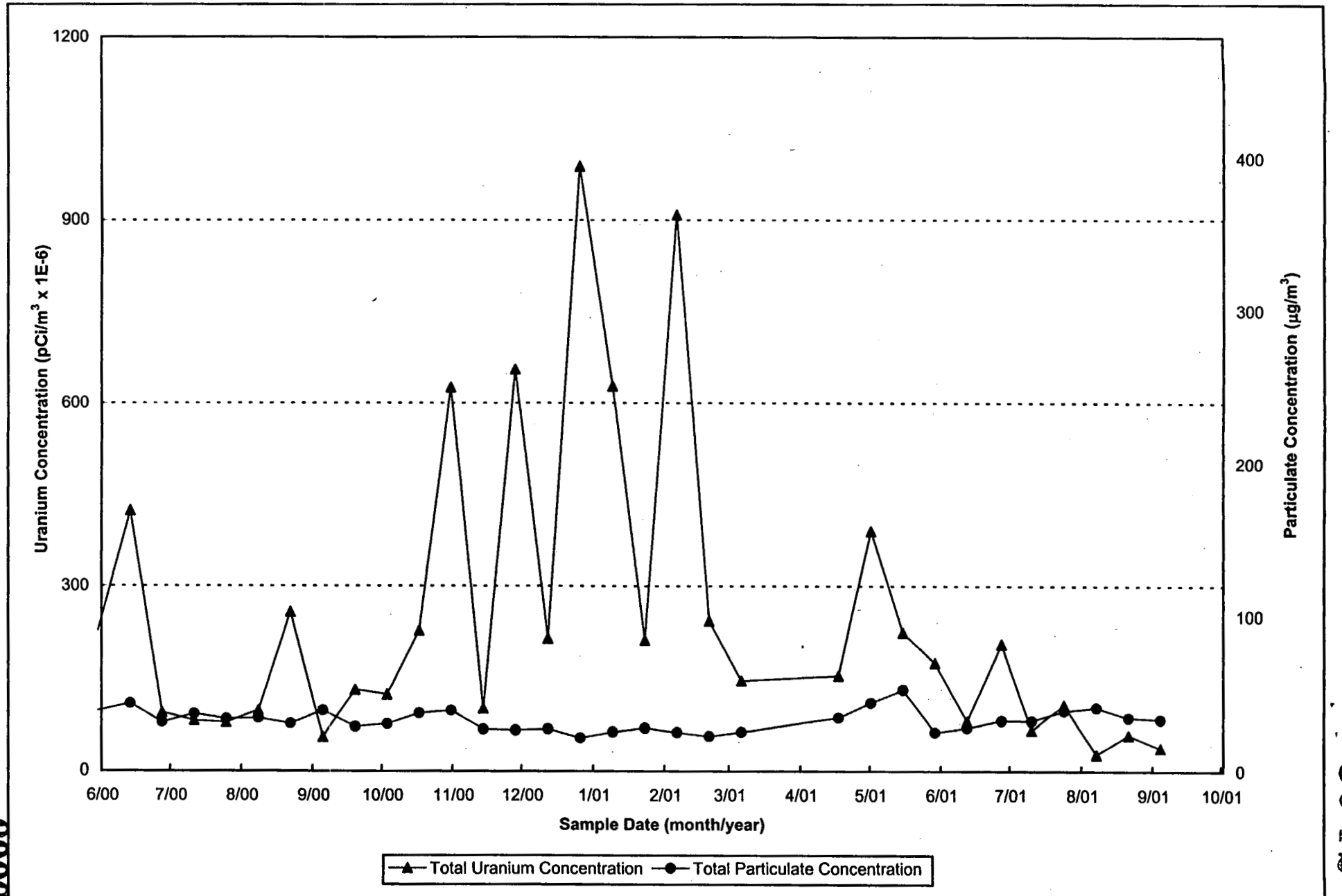


FIGURE 5-1. 2000-2001 TOTAL URANIUM AND PARTICULATE CONCENTRATIONS IN AIR (AMS-3)

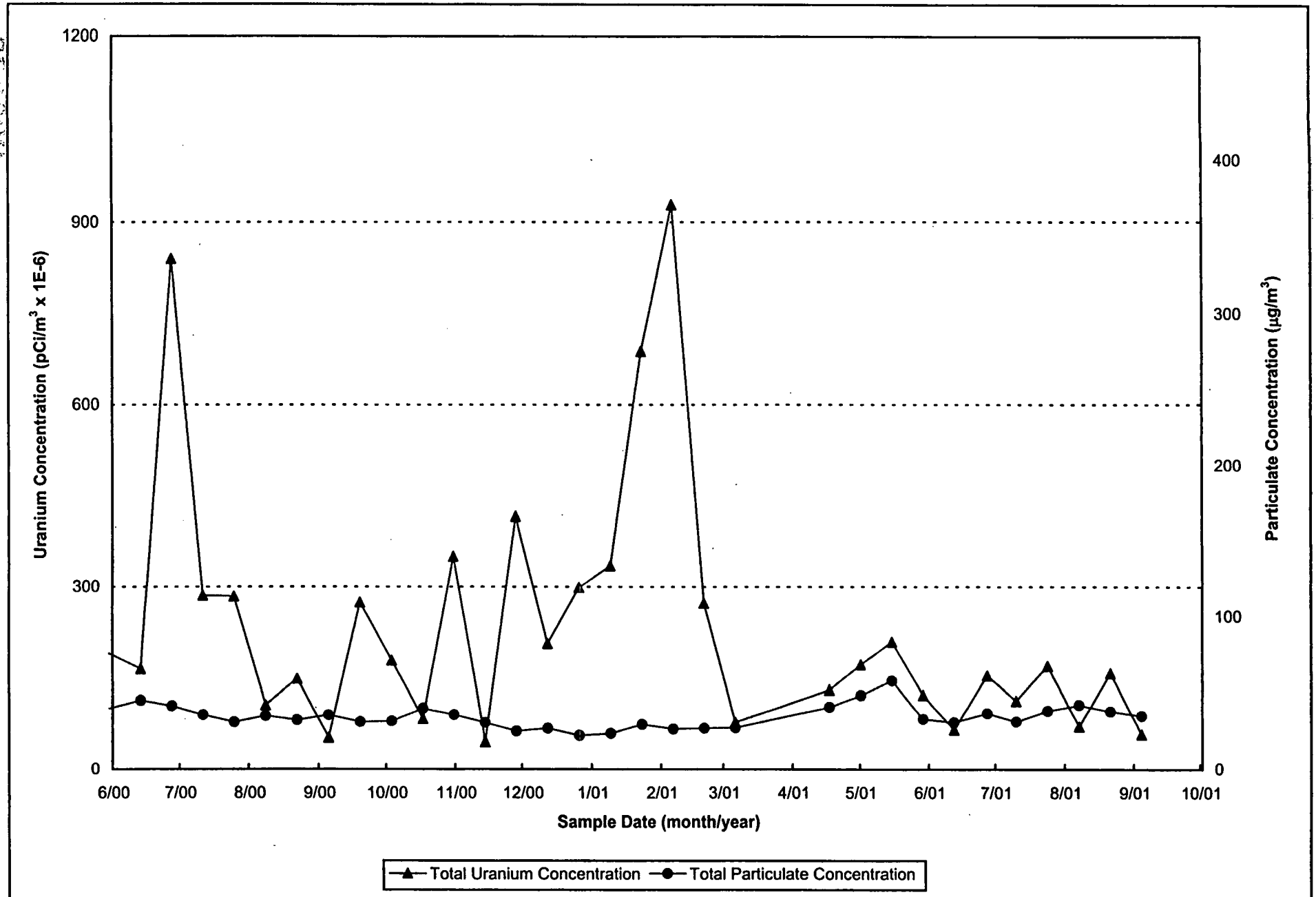


FIGURE 5-2. 2000-2001 TOTAL URANIUM AND PARTICULATE CONCENTRATIONS IN AIR (AMS-8A)

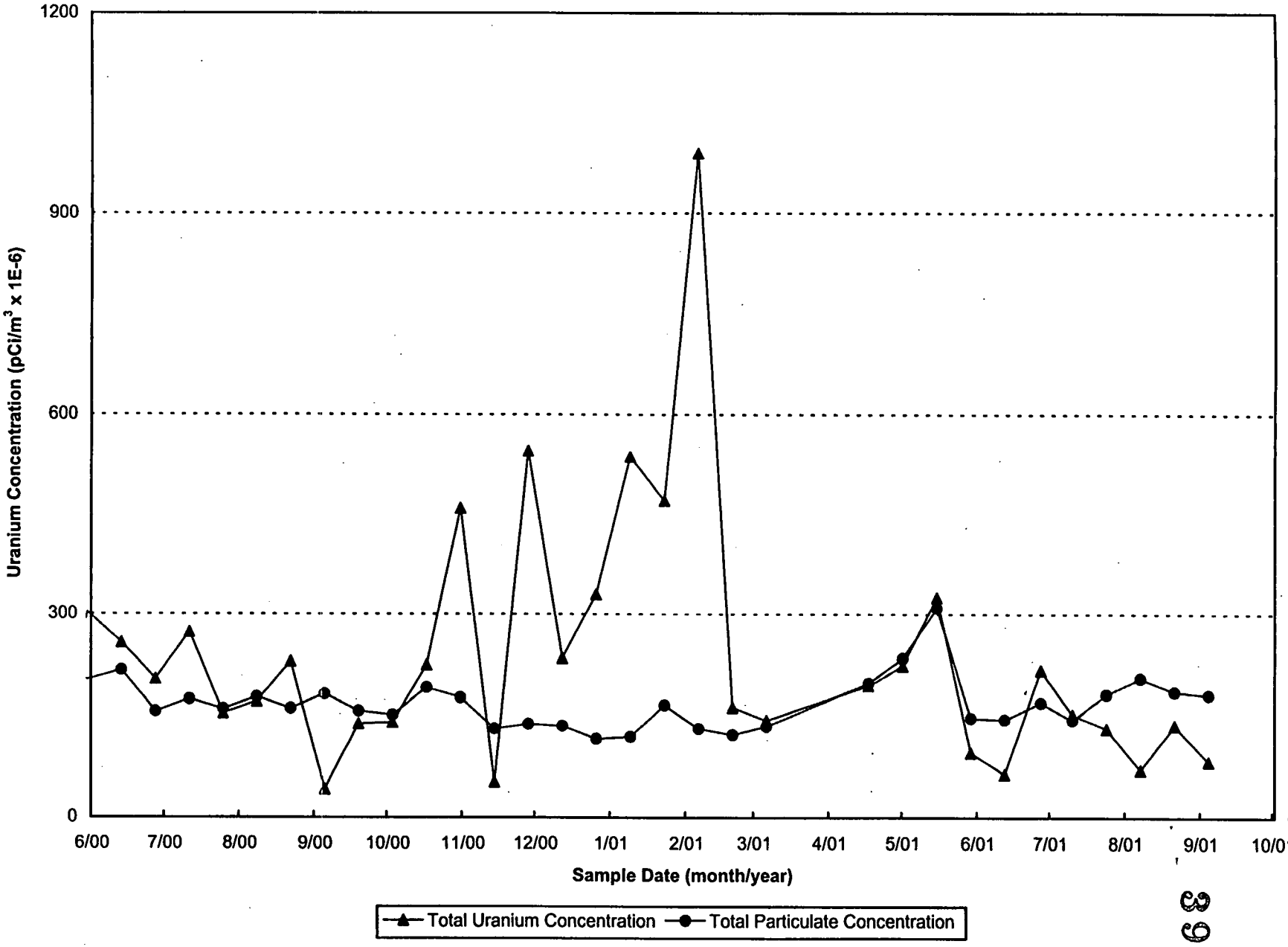


FIGURE 5-3. 2000-2001 TOTAL URANIUM AND PARTICULATE CONCENTRATIONS IN AIR (AMS-9C)

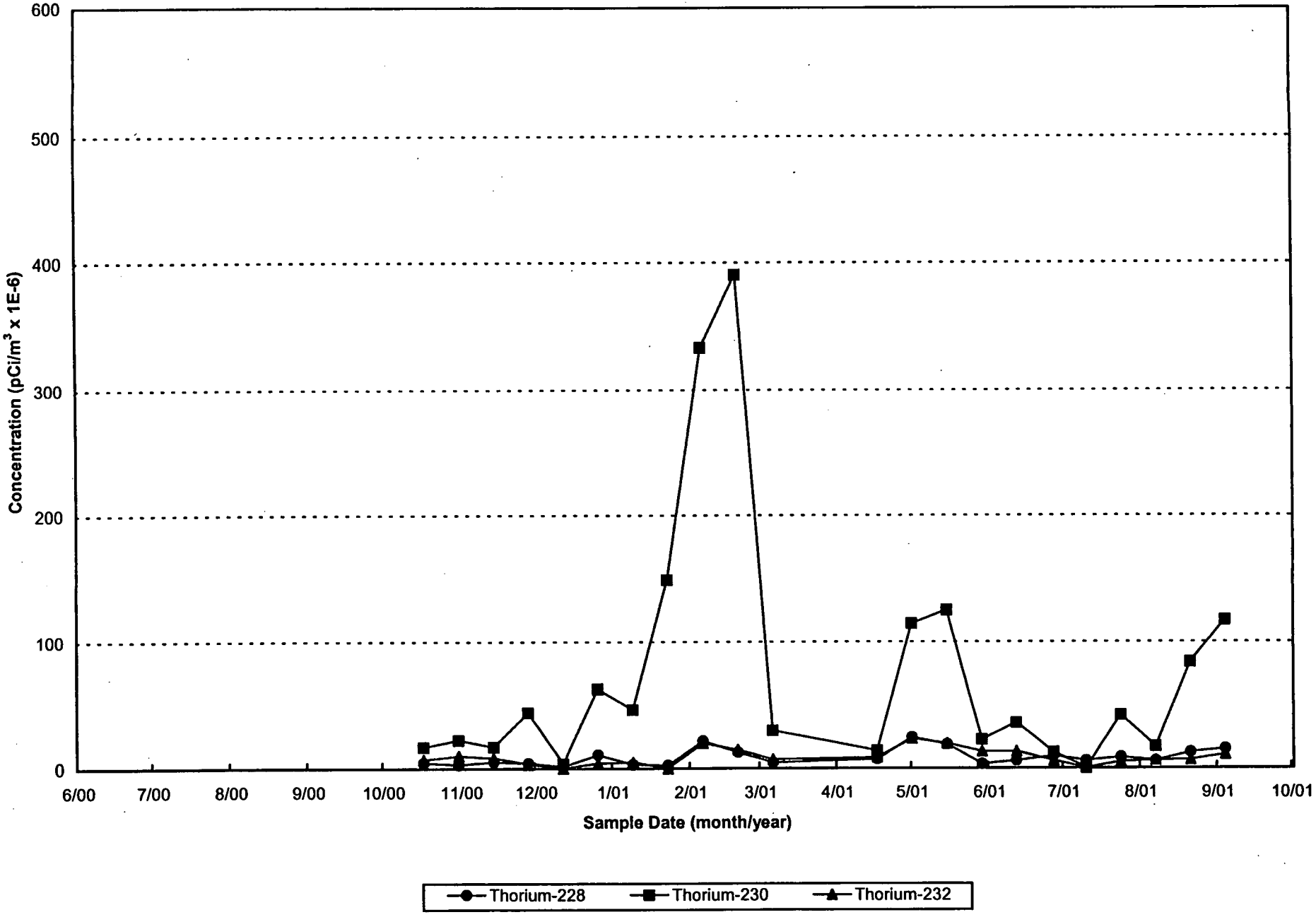


FIGURE 5-4. 2000-2001 THORIUM-228, THORIUM-230, AND THORIUM-232 CONCENTRATIONS IN AIR (AMS-3)

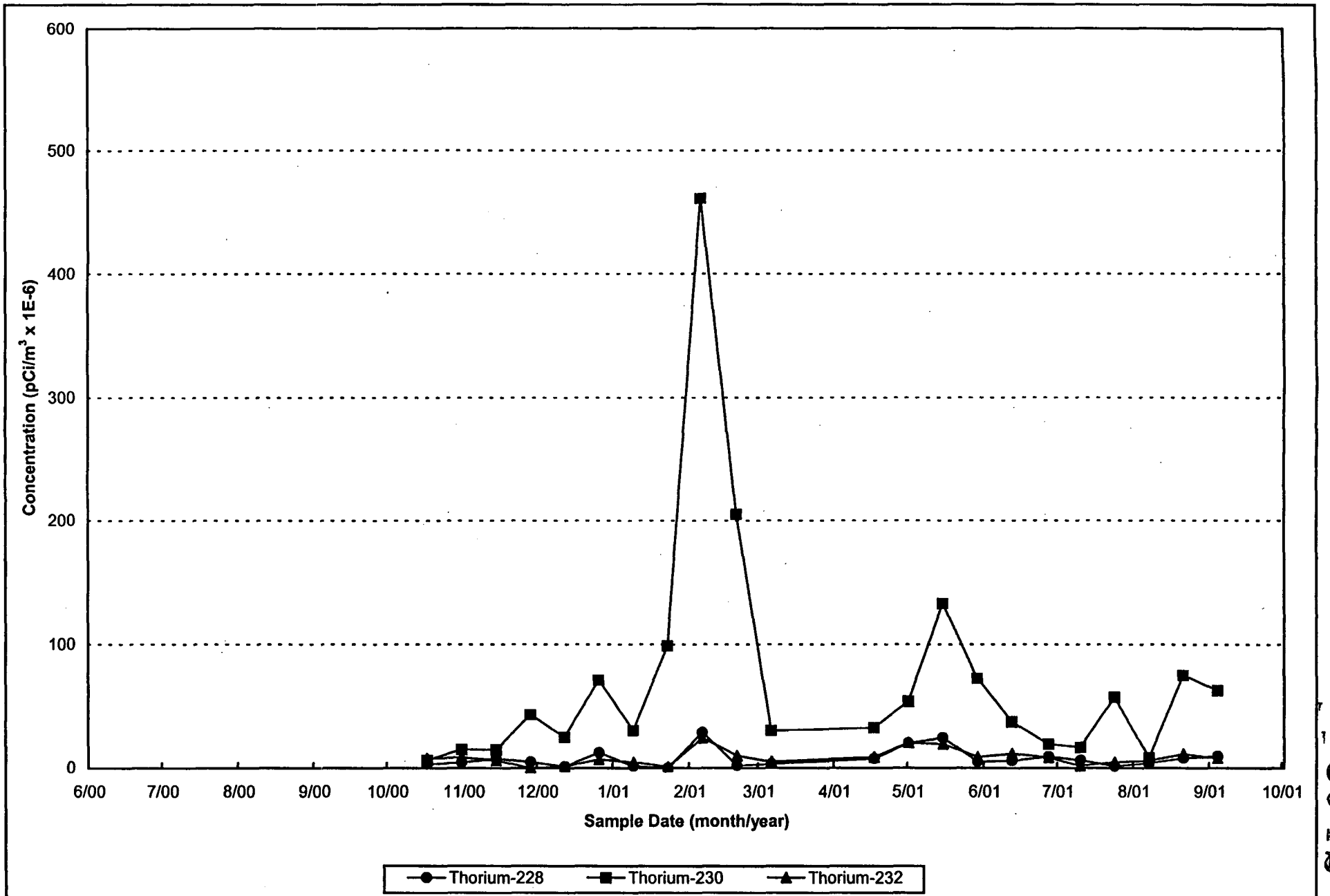


FIGURE 5-5. 2000-2001 THORIUM-228, THORIUM-230, AND THORIUM-232 CONCENTRATIONS IN AIR (AMS-8A)

FINA

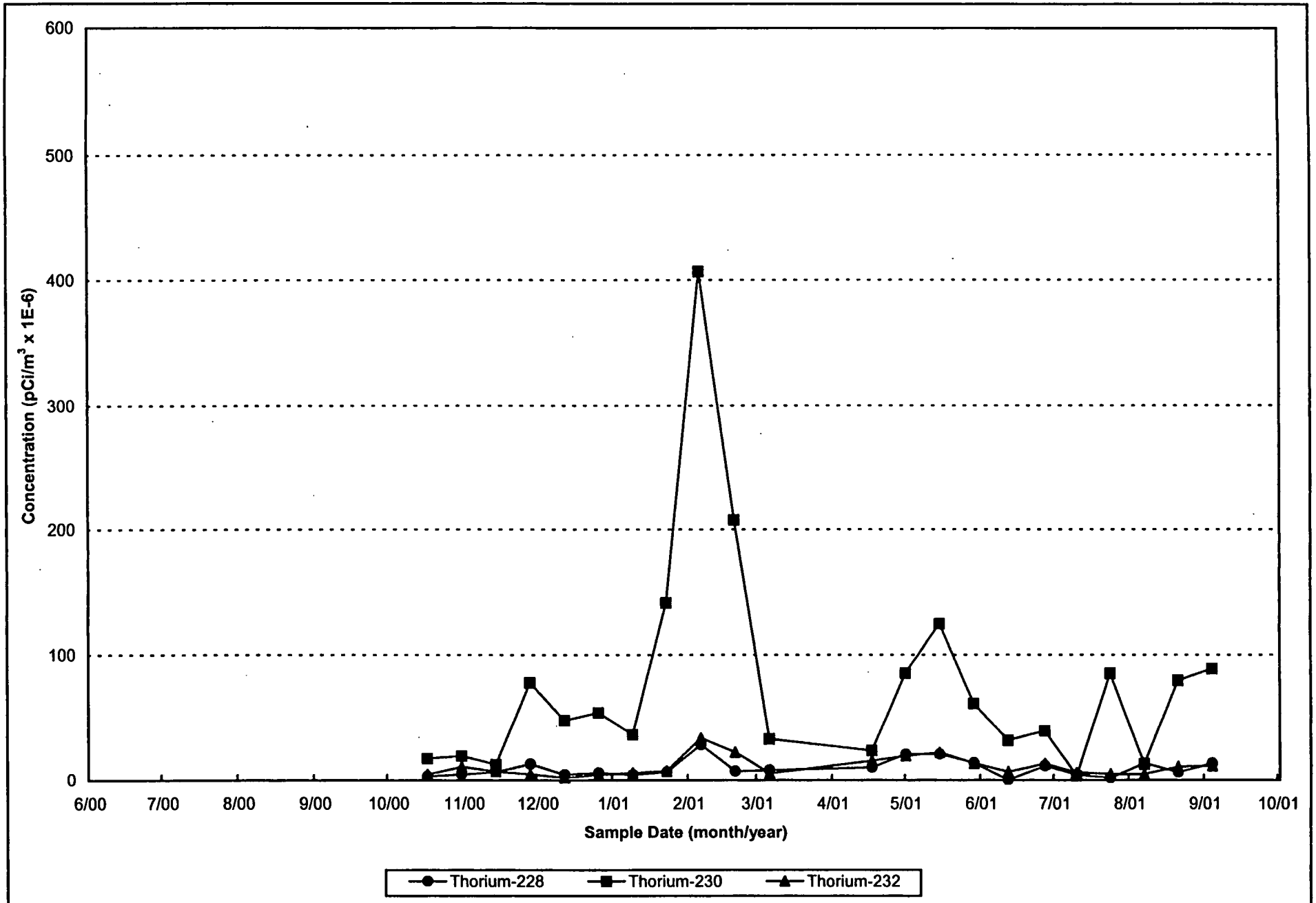


FIGURE 5-6. 2000-2001 THORIUM-228, THORIUM-230, AND THORIUM-232 CONCENTRATIONS IN AIR (AMS-9C)

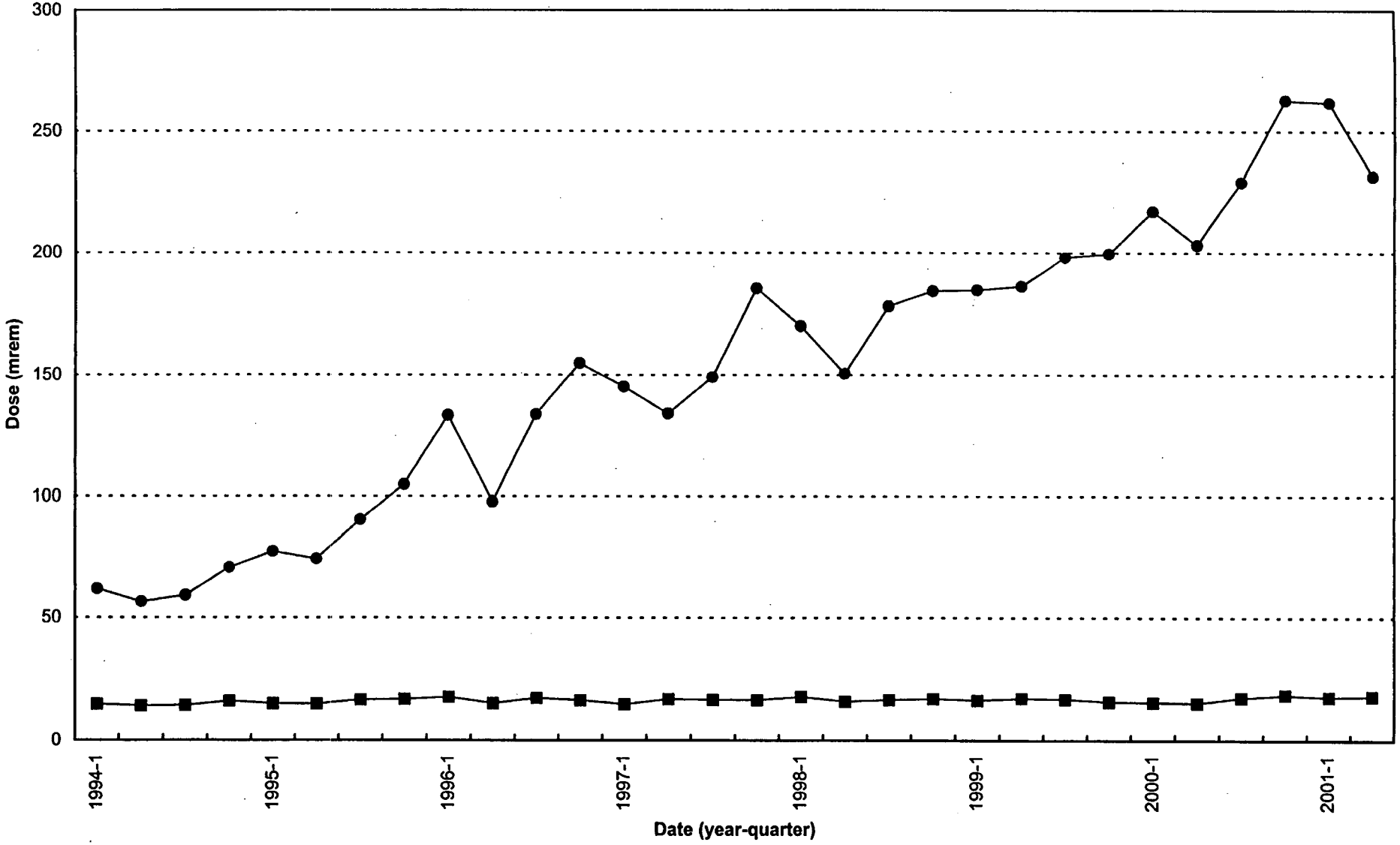


FIGURE 5-7. QUARTERLY DIRECT RADIATION (TLD) MEASUREMENTS, 1994 - 2001
(K-65 SILOS FENCELINE AVERAGE VERSUS BACKGROUND AVERAGE)

FINAL

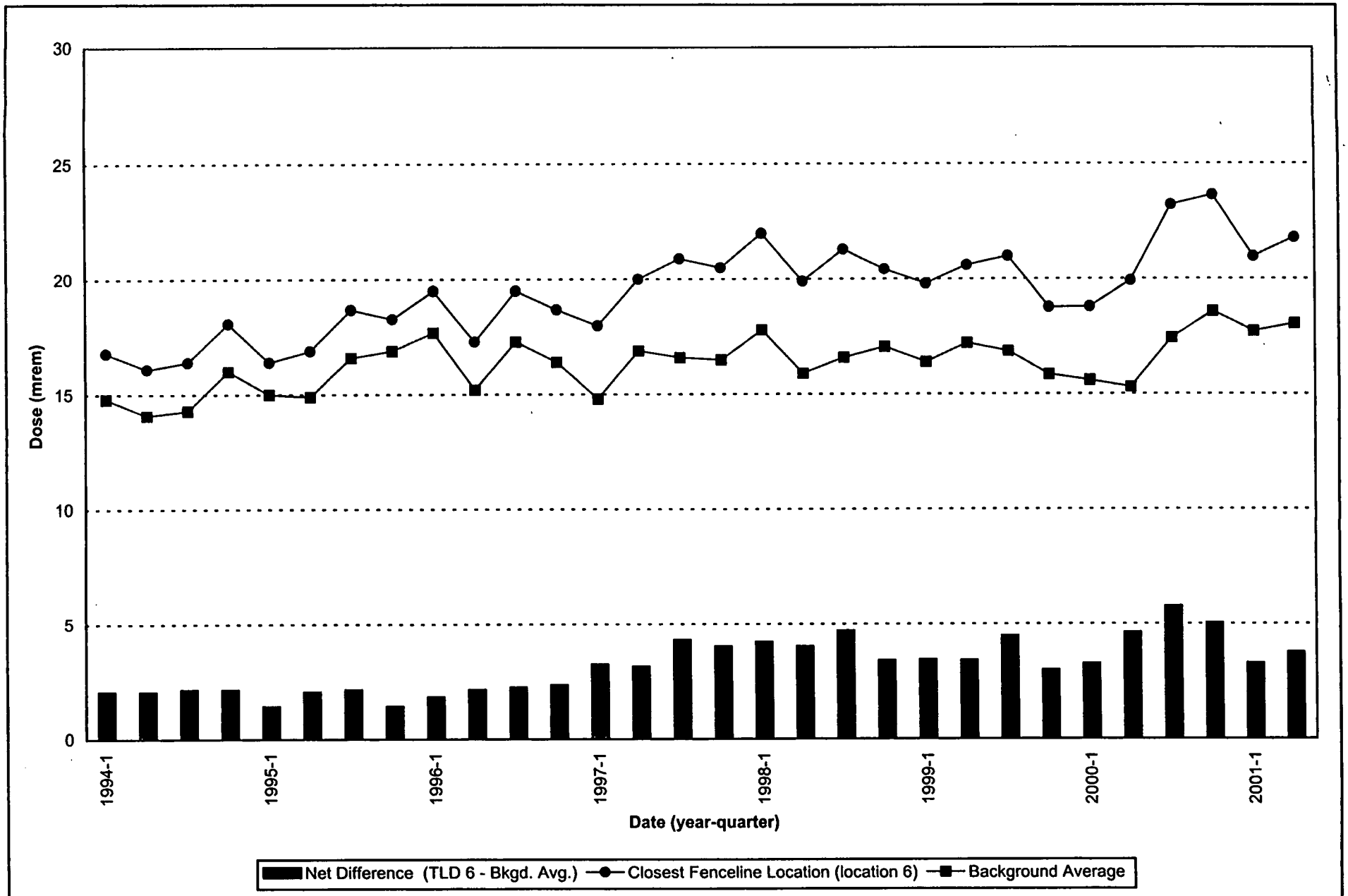
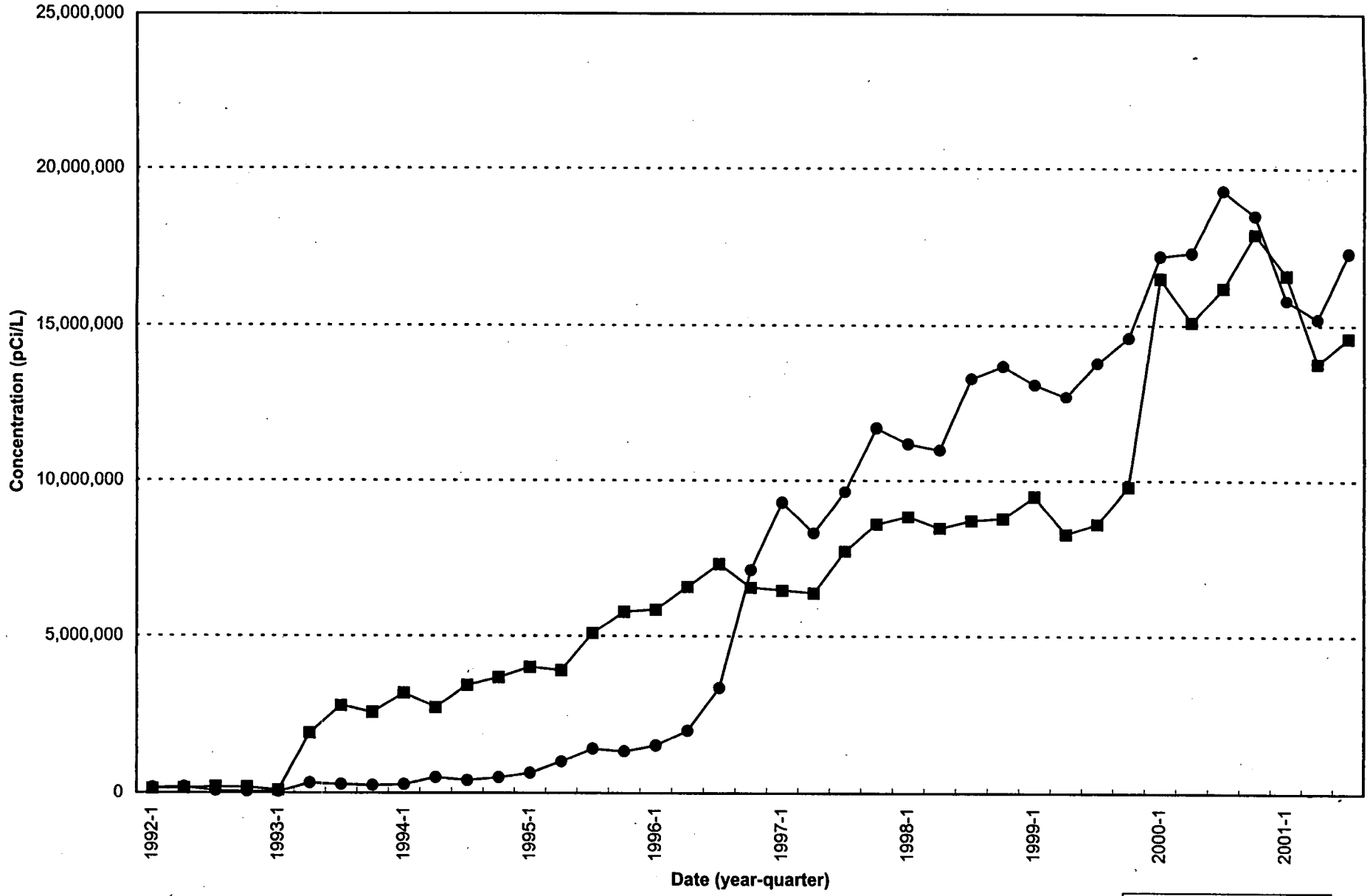


FIGURE 5-8. QUARTERLY DIRECT RADIATION (TLD) MEASUREMENTS, 1994 - 2001
(LOCATION 6 VERSUS BACKGROUND AVERAGE)



Note: 1) Defective sample line for Silo 1 was replaced during fourth quarter 1996.
2) Silo headspace correction was applied beginning with the first quarter of 2000.

FIGURE 5-9. QUARTERLY K-65 SILO HEADSPACE RADON CONCENTRATIONS, 1992 - 2001

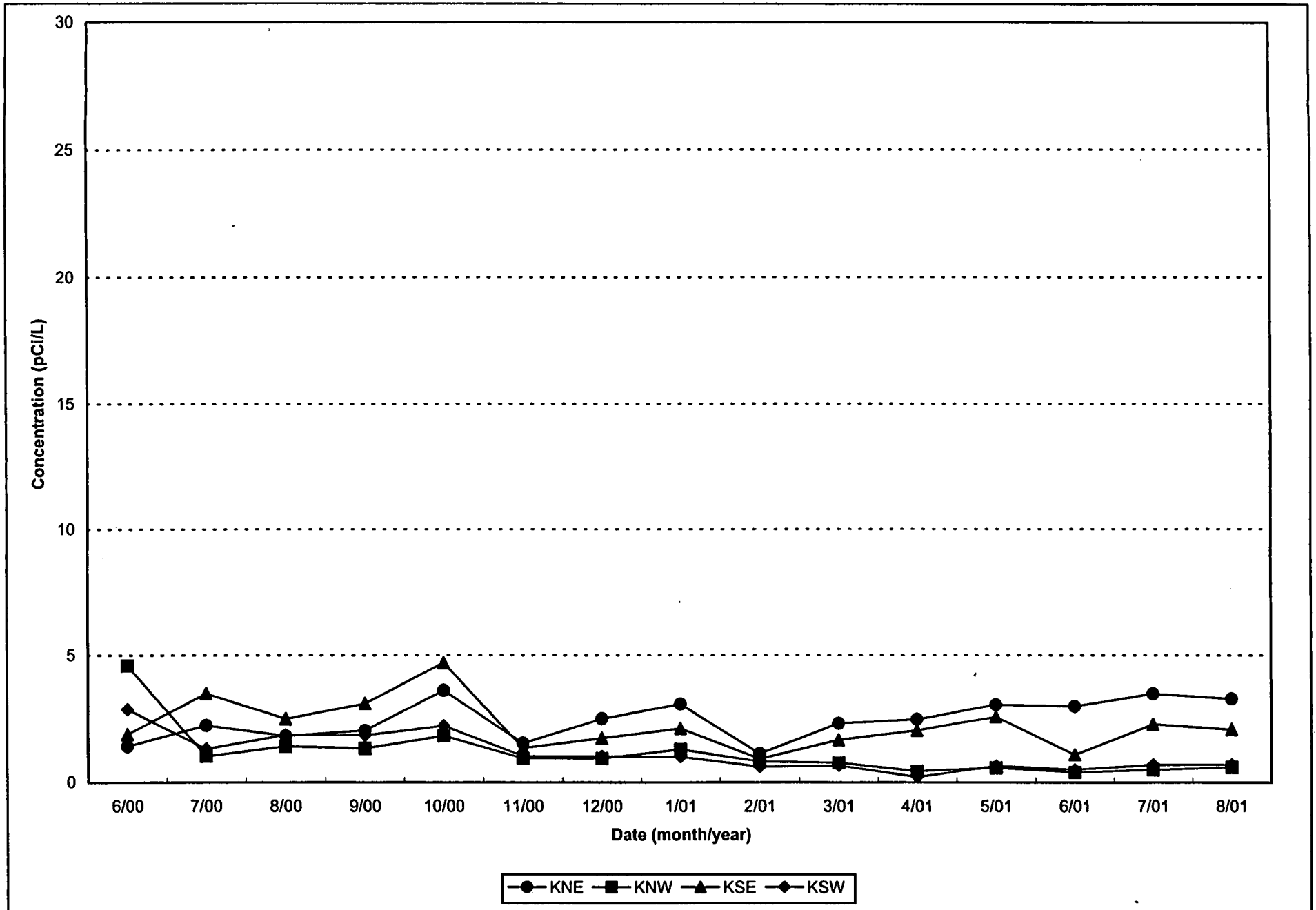


FIGURE 5-10. MONTHLY AVERAGE RADON CONCENTRATIONS
FOR SILO EXCLUSION FENCE MONITORS, 6/00 - 8/01

REFERENCES

U.S. Dept. of Energy, 2001a, "Integrated Environmental Monitoring Plan, Revision 2," Final, Fernald Environmental Management Project, U.S. Dept. of Energy, Cincinnati, OH.

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